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CHACOAN ROADS IN THE SOUTHERN PERIPHERY: RESULTS OF PHASE II OF THE BLM CHACO ROADS PROJECT

Fred Nials John Stein John Roney

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Chacoan Roads in the Southern Periphery: Results of Phase II of the BLM Chaco Roads Project

By FRED NIALS, JOHN STEIN & JOHN RONEY

1987

United States Department of the Interior
Bureau of Land Management
Albuquerque District
Albuquerque, New Mexico

VOLUME INTRODUCTION

The Bureau of Land Management's cultural resources management program is designed to ensure that federal undertakings are carried out in a manner which does not damage significant cultural resources. Representative arrays of sites on public lands are protected and preserved for the benefit of both scholarly and public use.

In New Mexico, these objectives are met by a variety of cultural resource program activities. Inventory, evaluation, monitoring, patrolling, law enforcement, stabilization, restoration, scientific research, public interpretation, and curation are just a few of the activities undertaken to manage these unique, non-renewable resources.

Over the years, it has become apparent that federal agencies cannot succeed in protecting this nation's cultural heritage without the active support of the American public. This Cultural Resource Publication Series is intended both to advance the field of anthropology and to interpret cultural resources for the public. Cultural resources management is uniquely positioned to sponsor projects which contribute to academic progress in the field as well as further public understanding of our shared cultural heritage.

This first volume of our publication series is an excellent example of a research effort which adds to the general body of archaeological knowledge of Chacoan Roads, interprets these sites in easily understood terms, and provides information essential for management in an area subject to multiple-use and development. Subsequent issues in this series will be those studies which can best instill a sense of appreciation for New Mexico's rich and varied past.

The current volume stems directly from the first Chaco roads study published in 1983. This was titled *Chaco Roads Project Phase I: A Reappraisal of Prehistoric Roads in the San Juan Basin.* The Phase I study developed methodologies for discovering, evaluating, and interpreting prehistoric roads. Researchers developed new techniques to identify roads from both aerial and ground perspectives. The information potential contained within roads and associated sites and features was defined. It was effectively demonstrated how the analysis of the significance of particular sites is best carried out when the entire road system is understood as a functional entity.

This volume represents the next phase of prehistoric roads research. Here, the authors apply the methodologies developed earlier to evaluate and verify the presence of dispersed prehistoric road systems throughout the San Juan Basin. New and exciting patterns of road-site association are discovered. Methods fine-tuned in this study to locate roads, inventory their characteristics, classify them based on physical traits, and establish clear definitions for terms describing road attributes will greatly aid future research on these fascinating and subtle prehistoric phenomenon.

Stephen L. Fosberg, Series Editor

Forward

Almost four years have passed since completion of the research reported in this publication. During these years a number of new Chacoan buildings were recognized and many have associated road segments. Non-residential characteristics of these structures continue to emerge as consistent aspects of Chacoan architecture. These include roads, earthworks, and areolas – the road-like swales which often encircle Bonito style buildings.

It is now clear that such roads are much more widespread than previously suspected. Despite these new discoveries, our overall understanding of prehistoric roads and their role in Chacoan society has advanced little. There is a growing consensus that the roads were a part of social organization rather than as transportation features, but no clear interpretation of their function is apparent. The overall layout of the road network is also unknown. The roads may represent a single integrated system or may comprise a series of sub-regional networks.

It is even possible that many road segments relate solely to single Bonito style buildings. Many different hypotheses can be framed around these issues but most interpretation hinges upon more thorough reconstruction of the entire road network.

This poses the most serious problem in managing prehistoric roads – their initial identification. Once roads have been identified or even suspected, they are relatively easy to deal with. By comparison to other archeological features, roads are not complex. They lend themselves well to data recovery in the context of individual surface-disturbing projects. In contrast, it is very unlikely that new roads will be discovered in the course of specific projects. The roads are very subtle features and are almost never identified through traditional archeological surveys. Their initial discovery requires application of specialized methodologies over extensive areas. It is a situation in which our normal project-specific approach to managing cultural resources is insufficient.

The only long-term solution to this problem is to continue making concerted area-wide efforts to trace known road segments and to identify new segments before they are impacted. Although imposing, this task will become easier as our knowledge of the distribution of Chacoan structures becomes more complete and we learn more about the nature of prehistoric roads. The BLM hopes to undertake another project in the near future focusing on roads outside the immediate Chaco Canyon area. It is hoped that publication of the present study will also encourage similar efforts elsewhere on the Colorado Plateau.

John Roney, Albuquerque District Archeologist

TABLE OF CONTENTS

INTRODUCTION 1

Project Objectives 1

Phase I Background 1

THE VERIFICATION PROCESS 3

General 3

Photointerpretation 3

Ground Observations 3

LOCATION & VERIFICATION METHODOLOGY USED IN PHASE II 4

General 4

Examination of Aerial Photography 4

Aerial Reconnaissance 5

Examination of Known Outliers and Roads 5

Exploration for Road-Associated Sites 5

Exploration for Preserved Road Construction Features 7

Exploration for Areas of Enhanced Visibility 7

Elimination of Areas from Initial Search 7

Statement of Methodology 7

PHASE II ARCHEOLOGICAL FEATURES 8

General 8

Great Houses 8

Great Kivas 11

Herraduras 11

Avanzadas 14

Zambullidas 14

Road Construction 14

Earthworks 15

Platforms 16

Patterning 16

PHASE II RESULTS 18

1. South Road 18
2. Yin Ya'a to Ruby Wells Ranch Road 19
3. Southeast Road 20
4. Coyote Canyon Road 21
5. Standing Rock Area 21
6. Kin Klizhin to Kin Bineola 22
7. Case Del Rio to Lake Valley Road 22
8. Padilla Well 22
9. Ah-shi-sle-pah 23
10. Kin Nizhoni Complex 23
11. Haystack Complex 23
12. Gasco Herradura 23
13. Andrews to Casamero 23
14. Muddy Water Complex 23
15. Kin Bineola to Bee Burrow 24
16. Kin Ya'a to Kin Bineola 24
17. Chacra Face Road 24
18. Mexican Springs Road 24

CONCLUSIONS AND RECOMMENDATIONS 24

Introduction 24

Conclusions Pertaining to Archeology of the Bonito Phase 25

Conclusions Pertaining to the Location and Verification Methodology 25

Management-Related Conclusions and Recommendations 26

Future Directions of Study 27

APPENDIX I: CHACO ROADS PROJECT PHASE II ANNOTATED MAPS 30

APPENDIX II: AN INVENTORY OF SITES SIGNIFICANT TO THE STUDY OF CHACOAN ROADS IN THE SOUTHERN SAN JUAN BASIN 142

BIBLIOGRAPHY 211

LIST OF MAPS, FIGURES

Figures:

Figure 1 – Roads in Relation to Coal Leasing Tracts 2

Figure 2 – Location of Phase II Low-sun-angle Photography 6

Figure 3 – Selected Road-related Features 10

Figure 4 – Index to Appendix I Maps 29

Tables:

Table 1 – Partial Listing of Documented Road Features 29

Table 2 – Documented Herraduras 12

Table 3 – Spacing Between Sites Along Prehistoric Roads 17

Introduction

Project Objectives

The southern San Juan Basin is underlain by large quantities of coal resources at shallow depth. Intensive mineral exploration activities within the last several decades has resulted in the delineation of a number of areas with coal of proper grade, quantity and depth to be economically mined by stripping. Large portions of these commercially viable coal resources underlie public lands between Chaco Canyon and the Dutton Plateau to the south.

Previous photoanalysis of some of these areas resulted in the identification of a series of possible prehistoric roads connecting Anasazi communities in the southern San Juan Basin and Red Mesa Valley with Chaco Canyon. Several of these possible roads cross potential coal lease tracts.

In particular, the South Road crosses the Crownpoint East tract, the Kin Ya'a to Ruby Wells Ranch Road crosses the Crownpoint Northeast tract, and the Southeast Road crosses the Hospah and Lee Ranch tracts (Figure 1).

Many previous studies of prehistoric roads in the southern San Juan Basin were largely photointerpretive efforts. Ground examination of the roads was, with few exceptions, restricted to the immediate vicinity of Bonito Phase great houses. Within the prospective lease areas no long segments of the potential Anasazi roads were examined in detail on the ground by any prior study. Consequently the BLM believed those portions of known or possible roads crossing prospective lease tracts should be examined to assess the potential significance of roads, road segments, or road-associated sites to ensure adequate management of these prehistoric resources.

The specific objectives of this project were to establish the presence or absence of prehistoric roads in the coal lease areas and, if roads were present, to delineate segments of the roads or road-associated sites that warranted mitigation. An additional objective of the Phase II project was to further refine recognition, photointerpretation, exploration, and verification techniques, as well as to further evaluate the nature, function, and significance of the roads to Chacoan society.

To meet these objectives the roads most intensively examined were the South Road, the Kin Ya'a to Ruby Wells Ranch Road, and the Southeast Road. A number of other Chacoan roads were checked to establish comparability, determine validity of previously imaged roads, and provide a starting point for reconnaissance activities. In addition, the relationship between roads and Chacoan outliers were examined at a number of Bonito style Great Houses.

After completion of the BLM sponsored portion of this project John Stein and John Roney continued investigations in the Grey Ridge, Standing Rock, Crownpoint, and Haystack areas.

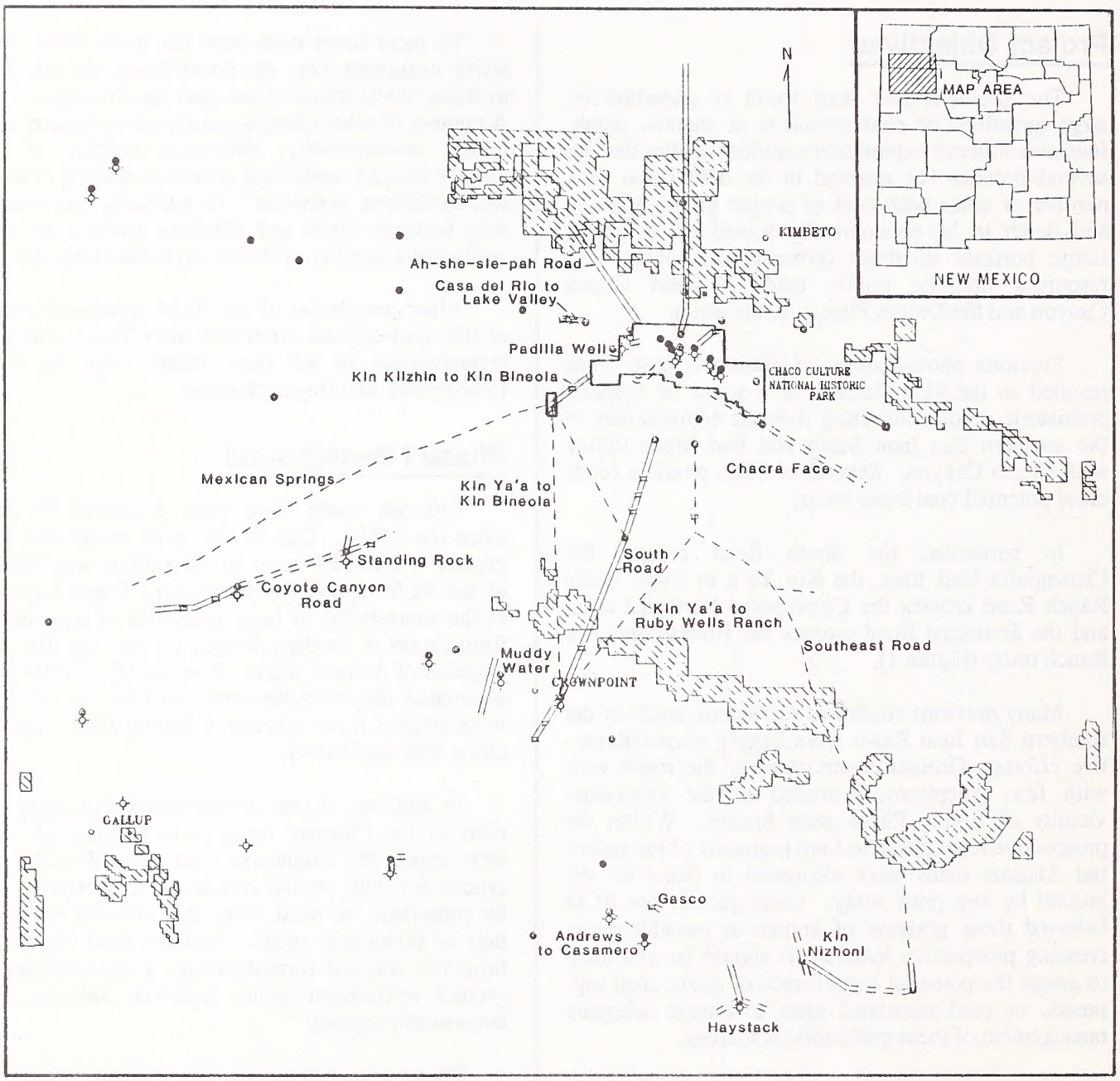
Phase I Background

Chacoan roads have been examined in detail since the 1960s. One of the most recent and most ground-oriented of these investigations was Phase I of the BLM Chaco Roads Project. Phase I resulted in the compilation of large quantities of data and the formulation of models thought to describe the many vagaries of Anasazi roads. A series of typically road-associated sites were described, and the fact the roads were largely, if not entirely, a Bonito Phase manifestation was established.

In addition, it was demonstrated that many portions of the Chacoan roads were constructed, roads were apparently engineered, and a set of recognition criteria for both ground and aerial perspectives could be compiled. In most cases this allowed identification of prehistoric roads. Perhaps most significant, however, was the formulation of a methodology for ground verification which could be uniformly and consistently applied.

Phase I investigations concentrated mainly on roads or road segments previously investigated to some extent, which were in large part readily identifiable on aerial photography, and which in many areas could be seen from the ground.

The "roads" of primary interest in Phase II, however, were extremely variable. Some were poorly visible on the aerial photographs, seldom visible on the ground, and devoid of artifacts.



LEGEND

PREHISTORIC ROAD
SUSPECTED PREHISTORIC ROAD
LINEAR FEATURE
CHACOAN OUTLIER
GREAT KIVA
HERRADURA
COAL TRACT

10 0 10 20 MILES
SCALE

FIGURE 1
ROADS IN RELATION TO COAL LEASING TRACTS

The Verification Process

General

There are a variety of ways in which a prehistoric road may be located, identified, and verified. These include remote methods such as aerial reconnaissance, interpretation of aerial photography; and ground methods such as examination of surface physical characteristics (width, depth, border elements, constructed features), distribution of road-associated structures (Bonito Phase great houses, herraduras, zambullidas) and subsurface physical characteristics (modified soil structure, consistence, color).

Photointerpretation

With the exception of aerial reconnaissance (discussed below), photo-interpretation provides the most efficient means of locating prehistoric roads, and this is the way most Chacoan roads were initially located, except locally near some outliers. This method of road location is, however, limited by the fact that age assignments of photointerpreted roads are sometimes inaccurate. Photorecognition charts listing the criteria for distinguishing between historic and prehistoric roads were prepared as a result of Phase I investigations. However, the utility of these criteria may be limited due to inexperience of the interpreter with prehistoric roads, and by the fact that both historic and prehistoric roads exhibit a wide range of photocharacteristics. In addition, a variety of other features may locally resemble prehistoric roads (Loose and Kemrer 1982; Nials 1983: 5-21 to 5-25).

As a result of the uncertainties involved, one conclusion of the Phase I investigation was that aerial photographs should be extensively utilized in the initial location process, but should not be the sole means of identification and evaluation of linearities, with the exception of some of the most obvious historic and natural features. Published reports to the contrary, ground examination should be considered an essential part of the prehistoric road verification process.

Ground Observations

Of all the criteria that may be used for verifying prehistoric roads, the physical characteristics are most easily observed. Examination and description of physical characteristics, however, is not always the most reliable means of identifying prehistoric roads.

Prehistoric roads can normally be differentiated on the basis of width, depth, border elements and construction features in those areas where a roadway depression is visible. In some instances, however, long-abandoned historic roads may strongly resemble their prehistoric counterparts, and other criteria may be required for verification.

Archeological criteria for verification of Chacoan roads, although often difficult to assess, provide the only conclusive means of identification. Phase I investigations resulted in the conclusion that the roads could be followed in many instances by the linear distribution of artifacts along the roads. In addition, cigar shaped sherd scatters were also regarded as an indication of the prehistoric age of roads, when in direct association with a visible or projected alignment. As with physical characteristics, however, there are relatively few instances where artifact density alone is sufficient means of verifying the presence of a prehistoric road. Verification of the prehistoric age of a road should not, in most instances, rely solely on the distribution of artifacts along the observed or suspected alignment.

Several types of archeological structures have been interpreted as being consistently road-associated. These include a variety of Bonito style structures, such as great houses, great kivas, herraduras and zambullidas. Bonito style great houses appear to be ubiquitously road-associated, and are here considered as a part of the road design and construction. One of the more common means of exploring for Anasazi roads in recent years has been to first locate the great houses and then trace the roads outward.

There are instances in which a great house has no apparent road in association, but this is probably a function of secondary processes of erosion and deposition which have destroyed or obscured the road. In many instances, however, readily visible segments of Chacoan roads may be found in the immediate vicinity of these structures. Unfortunately, great houses are sometimes separated by great distances, which limits the accurate projection of any roads that might connect these sites. Another structure thought to be uniformly road-associated is the herradura. These small, horseshoe to circular shaped structures are often found in apparent association with a road or projected road alignment. These structures provide a convenient mechanism for exploration

of roads in that they tend to occur in certain topographic positions, thus minimizing the reconnaissance process. Herraduras and other potentially road-related structures are discussed in detail in a later portion of this report. Lesser features such as ramps or landings, toe and hand holds, formal pecked or constructed stairways and long grooves pecked into slickrock also occur along prehistoric roads.

Subsurface investigations provide another means of determining the relative age of roads. Trenches excavated across roads during the Phase I investigations showed that historic roads were characterized by distinctive subsurface modification of soil stucture, and that the limits of prehistoric roads could be clearly defined in some instances. No trenches were excavated during Phase II investigations because of time and access limitations.

Location & Verification Methodology Used In Phase II

General

Phase II of the Chaco Roads Project was designed to study photointerpreted Chacoan roads south of Chaco Canyon. Only limited portions of these roads were examined on the ground prior to this investigation. The roads selected for most intensive study were those interpreted as crossing areas delineated for possible future coal mining activity, namely the South Road, Southeast Road, and Kin Ya'a to Ruby Wells Ranch Road (Figure 1).

Although mining areas were of the most immediate interest, it was necessary to examine extensive areas outside the coal leases because there are often long portions of prehistoric roads which are not visible from either the aerial or ground perspective and because of the complexity of the verification process. In addition, several other prehistoric roads were examined because of the possibility they might cross coal lease areas.

As previously discussed, the location and verification of prehistoric roads is complex and often requires the combined evaluation of aerial photography, physical characteristics, and archeological evidence along presumed prehistoric roads. Although there are some instances where a single line of evidence may allow conclusive identification of prehistoric roads, usually corroborating evidence is required for verification. In some instances even the combination of several types of evidence does not allow the verification of an individual road segment. Because the characteristics of the roads are so variable, a rather specialized methodology is required for the location and verification of individual road segments.

It was determined by project personnel that the most efficient means of verification of photointerpreted roads in Phase II was to concentrate on the following:

1) examination of aerial photography,

2) aerial reconnaissance of all the known or suspected road alignments in question,

3) examination of known great houses in the study area to determine if the characteristics of associated roads in the southern portion of the Chacoan realm were similar to those observed in and north of Chaco Canyon during Phase I investigations,

4) exploration for those types of sites thought to be consistent in road-association and topographic occurrence,

5) examination of those areas along previously photointerpreted roads in which geologic or topographic conditions are favorable for preservation of recognition of prehistoric road construction features,

6) examination of those areas along photointerpreted roads in which geologic or topographic conditions are favorable for preservation or enhancement or roads because of the dominance of specific geological processes, and

7) elimination of those areas projected along photointerpreted roads where the roads are not likely to be preserved because of the dominance of specific geological processes.

Examination of Aerial Photography

A variety of aerial photography at several scales was used for the exploration of roads for this project. USGS photography, utilized by Obenauf (1980) for mapping the southern part of the San Juan Basin was loaned by the NPS, and also re-examined in detail. Coverage of most of the southern part of the San Juan Basin was available on SCS photography taken

during the 1930s. This photography had a nominal scale of approximately 1:30,000. Other aerial photography used included BLM-ARS color and black-and-white prints. Some portions of the South Road were examined on color photography available from Thomas R. Mann, Incorporated.

The superior utility of low-sun-angle (LSA) photographs taken during the Phase I investigations of Chacoan roads indicated that similar photography would be useful for this project as well. Consequently a photography plan was devised for the project and LSA photographs were taken of road alignments along the Southeast Road from Greenlee Ruin to San Mateo Ruin, Kin Ya'a to Ruby Wells Ranch Junction Road, and a portion of a suspected road from Kin Bineola to Kin Ya'a at a scale of 1:24,000.

A subsequent set of photographs was taken at a scale of 1:12,000, concentrating on the South Road and on roads emanating from Haystack Ruin and Kin Nizhoni. Figure 2 shows the location of low-sun-angle photography flown for this project.

Unfortunately the low-sun-angle photography was not available until near the end of the allotted field time. Consequently, the majority of initial photointerpretation relied on examination of aerial photographs from which roads were previously interpreted.

Field checks of many of the areas were based on previously located photolineations, virtually eliminating observation of new lineations which might be located by photointerpretation of the presumably superior low-sun-angle photography.

Aerial Reconnaissance

Aerial reconnaissance proved to be one of the most useful means of locating and evaluating previously unrecognized and photointerpreted road segments. Fixed-wing aircraft were used for this process, and all flights were made shortly after sunrise when the low-sun-angle usually enhanced the visibility of the roads. Although helicopters are more suited for this process, they were not used because of prohibitive expense.

Reconnaissance of this type offers several advantages over the examination of aerial photography normally used for locating the roads. The oblique view provides a more normal perspective for the viewer and allows easier recognition of linear features in many instances. The additional height afforded provides a much larger view of the landscape and allows one to evaluate the relationship between linear features and the landscape much more thoroughly.

The aerial reconnaissance method allows rapid evaluation of previously photointerpreted road segments and, in several instances, resulted in location of previously unknown roads or road segments. For example, the Penasco Blanco to Ah-shi-sle-pah Road was extended beyond Ah-shi-sle-pah Wash (Appendix I, Map 45) by aerial reconnaissance after intensive conventional photo interpretation and concentrated ground survey failed to show one trace of these segments. In some cases prehistoric roads were much more apparent in 35mm oblique photographs taken during aerial reconnaissance than in either conventional or low-sun-angle aerial photography.

Examination of Known Outliers and Roads

Phase I investigations were concentrated in the Basin floor within 10 miles of Chaco Canyon. The few previous ground investigations of Chacoan roads in the southern San Juan Basin indicated that their characteristics were similar to those roads studied in Phase I. It was important, however, that this be conclusively demonstrated in order to better assess and develop a verification methodology. Initial Phase II ground efforts were concentrated in the vicinity of great houses in the southern San Juan Basin, Dutton Plateau and Red Mesa Valley areas because many road segments were previously photointerpreted near these sites and because roads are usually visible on the ground near the structures. Consequently great houses provide a logical initial point for the tracing of Chacoan roads. Great houses considered in this aspect of the project included Kin Ya'a, Muddy Water, Standing Rock, Blue Water Spring, Casamero, Andrews, Haystack, Kin Nizhoni, San Mateo, Greenlee and Lower Greenlee, Tse Lichii and Tse la Vie, and Upper Kin Klizhin. In addition, the Grey Ridge Compound and the Deer Springs Great House were discovered as a direct result of ground reconnaissance along an imaged or projected alignment.

Exploration for Road-Associated Sites

Several other types of sites appeared to be consistent in their road-association and topographic occurrence. The most notable of these are herraduras. Although the geographic distribution and spacing of the herraduras is not completely predictable, all known herraduras are presumed to be road-associated. All are located on topographic high points which are relatively prominent in the landscape and from which a lengthy portion of the road can be viewed in both directions. Because of these predictable characteris-

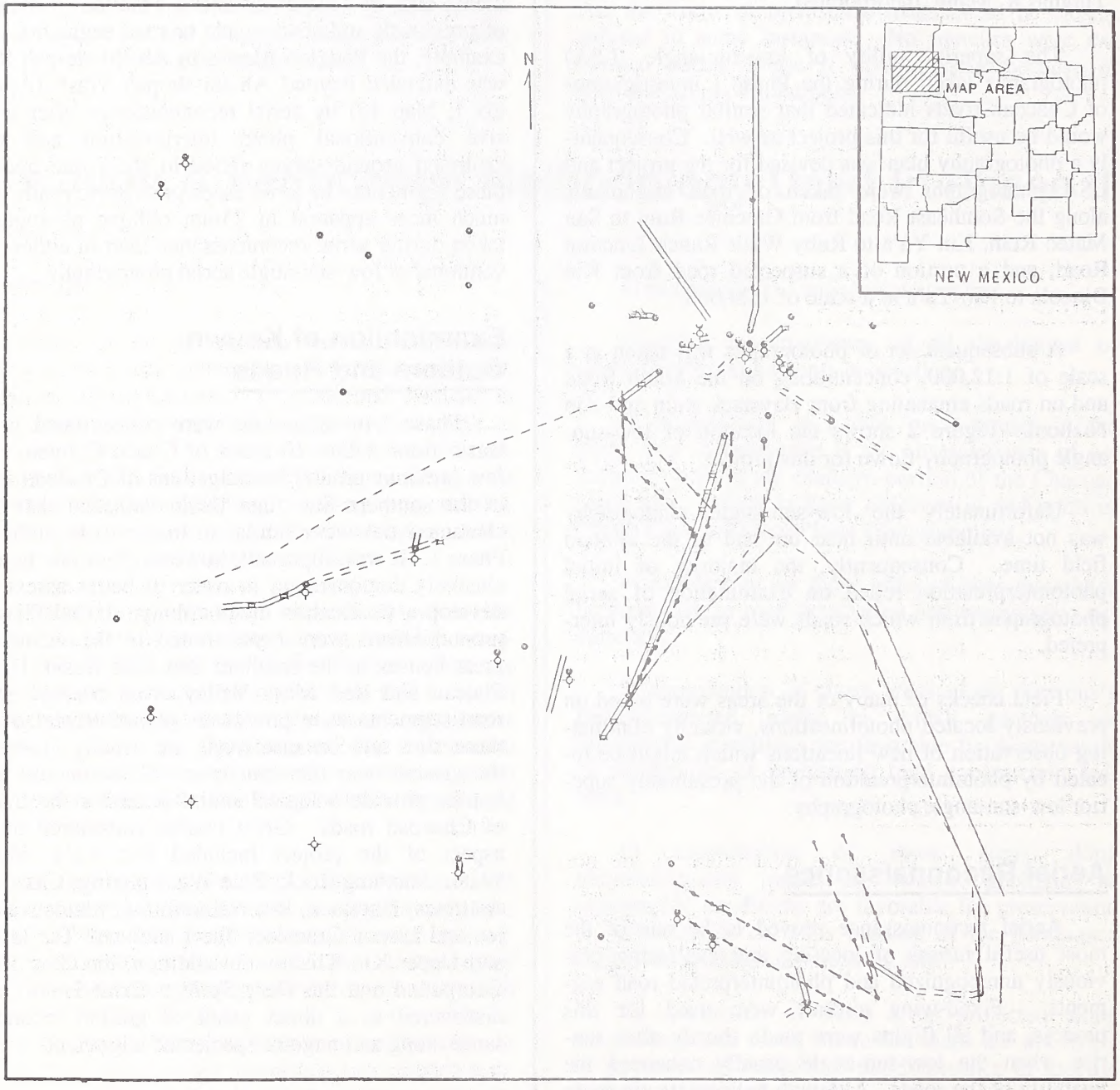


FIGURE 2

LOCATION OF PHASE II LOW SUN ANGLE PHOTOGRAPHY

tics and because the herraduras are often more easily seen, it sometimes proved more efficient to search for herraduras along suspected or projected road alignments than to search for the roads themselves. In addition to confirming the presence of a prehistoric road alignment, the herraduras provide a series of connecting points along which the road location can be more accurately projected. Because of the significance of herraduras to the road verification process, and because these features were not discussed in previous Chacoan archeological literature, a detailed discussion of these structural sites is provided in a later portion of this report.

Exploration for Preserved Road Construction Features

Phase I investigators concluded that preserved evidence of road construction in the form of rubble berms tends to be found in a relatively limited number of geological and cultural situations. These situations often occur on relatively narrow ridgetops, in other areas where sandstone is near the surface, and near some types of Bonito Phase structures including herraduras and great houses. Ramps, landings, toe- and hand-holds, and formal stairs obviously occur only in steep, broken sandstone topography. Similarly, pecked grooves are found only where roads cross large areas of bare slickrock. These observations isolate specific geologic contexts where evidence of road construction is most likely to be found.

Exploration for Areas of Enhanced Visibility

The majority of imaged road segments are not readily visible from the ground unless secondary processes have enhanced road topography. Erosional enhancement tends to occur in rather specific topographic situations, notable near the tops of moderate slopes where the road and slope are approximately parallel.

Elimination of Areas From Initial Search

Many portions of the landscape can be eliminated from initial search efforts because of the dominance of geological processes which obscure any prehistoric surface features that might have been present. Thus the lower portions of slopes, alluviated valley bottoms and areas of active sand dunes are not likely to contain visible prehistoric road segments. If photointerpreted road segments or visible swales are observed in these areas, they are probably of historic origin.

Statement of Methodology

To reiterate, certain aspects of prehistoric roads are somewhat predictable, notably the location of some types of road-associated sites, preserved constructed road segments, and road segments where visibility is likely to have been enhanced by secondary processes. It is therefore possible to develop a model for examination of selected portions of photointerpreted lineations most likely to contain recognizable evidence of prehistoric roads. The field methodology in this project was predicated on the assumption that utilization of this model provides the most efficient means of location and verification of Anasazi roads. Ground examination of the entire projected length of a photointerpreted road is not an efficient means of locating an alignment because the majority of a prehistoric road is not usually visible on the ground, either by physical characteristics such as a roadbed depression or by associated archeological materials.

The methodology ultimately utilized for ground location and verification of the photointerpreted roads consists of the following:

1. Compilation of previous photointerpretation, augmented periodically by photointerpretation of low-sun-angle photography specific to this project.

2. Transfer of photolineations to a 1:24,000 topographic map base. This was accomplished by means of a zoom transferscope.

3. Ground observation of actual imaged segments.

4. Analysis of aerial photographs and topographic maps to determine those locations along projected road alignments fitting the prediction model outlined above. This resulted in the delineation of additional "target areas" for ground examination.

5. Aerial reconnaissance of suspected and/or projected road alignments.

6. Upon location of any features that could be tentatively identified as either prehistoric road segments or road-associated architecture, the road was projected to the next target area along the alignment. After location of a series of such features, intervening areas were then searched.

7. If multiple connecting points were not located along the initial alignment projection, target areas were examined in an arc prescribed from the last located feature.

Phase II Archeological Features

General

As a result of field research conducted by the BLM on the Chacoan road projects, it was determined that the roads represent an extension of Bonito style architecture. All structural manifestations articulated with the roads can be considered Bonito style, including masonry ramps, platforms, stairways and earthern architecture. A partial list of documented road features is listed in Table 1 and their locations are shown in Figure 3.

From an archeological standpoint, verification of a road system was partially contingent on the location of an architectural (structural) aspect of the road. This is not a new strategy, as this was largely used by the Remote Sensing Project in the early 1970s (Morrison 1973, 1979). At present only very specific types of structural manifestations are known to be physically articulated with the road surfaces. These include great houses, great kivas, and herraduras. Three other architectural classes remain problematical, primarily due to the limited number recorded to date. These are avanzadas, zambullidas and platforms. Actual road construction is another structural characteristic which was considered in detail. Evidence of construction usually consisted of rubble berms. Berms in the vicinity of Great Houses are sometimes elaborated into artificial earthworks.

This is illustrated in the Red Mesa Valley and Dutton Plateau where three or more roads often converge on a single structure, similar to cattle trails approaching a water tank. Haystack (Appendix I, Map 48), Kin Nizhoni (Map 47), and Standing Rock (Map 38) are especially good examples. We believe most great houses have associated roads. Furthermore, exagerated berms described as earthworks later in this report often accentuate the articulation of the roads with great houses.

In addition, many great houses are encircled by road-like swales. This is best seen at Manuelito Ruin, where a massive berm encircles the great house on the east and south and where artificial fill on the west side of the great house maintains a level surface around the ruin. At Kin Ya'a a broad, shallow, apparently excavated swale encircles the great house and is particularly visible along the northwest edge of this structure. At Haystack Ruin the natural terrain appears to have been modified by excavation at the northern edge of the ruin. In this area the side of a very low hillock appears to have been removed by excavation, resulting in a broad swale around the northern and western margins of the great house. Similar features are present, though more subtle at Kin Nizhoni, Standing Rock, and Lake Valley.

Great Houses

Attributes considered characteristics of the great house architectural form are described by Marshall et al. (1979). The great house is a surface construction containing large rooms with high ceilings. The structure will almost always have a large surface kiva incorporated into the house block. Construction is massive in character, utilizing rubble-core masonry. This architectural form appears in the Basin floor at around A.D. 900. By A.D. 1050 classic great houses were very likely engineered and constructed coeval with the formalization of the road system. Great houses represent the highest level architectural sophistication on the roads and often represent the nexus of several roads. This is illustrated in the Red Mesa Valley and Dutton Plateau where three or more roads often converge on a single structure, similar in appearance to cattle trailes approaching a water tank. Haystack (Appendix I, Map 48), Kin Nizhoni (Map 47), and Standing Rock (Map 38) are especially good examples. We believe most great houses have associated roads. Furthermore, exaggerated berms described as eathworks later in this report often accentuate the articulation of the roads with great houses.

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TABLE 1

PARTIAL LISTING OF DOCUMENTED ROAD FEATURES

South Road		
Ko Pavi	Herradura	LA46008
Crownpoint	Herradura	LA46009
Kin Ya'a	Great House	LA8778
Sa'Kwa	Great Kiva	LA40015
Holsinger's Great Kiva	Great Kiva	LA40015
Llave de la Mano	Herradura	LA38109
Llave de la Mano	Platform	LA38110
Bee Burrow	Great House	LA13163
Washout Roomblock	Zambullida	LA38106
Seven Lakes No. 1	Herradura	LA38104
Seven Lakes No. 2	Herradura	LA38105
Nose Rock	Herradura	LA14787
Credibility Gap	Herradura	LA34233
La Mesita de la Junta	Shrine	LA34230
Casa Patricio	Great Kiva	LA34208
Upper Kin Klizhin	Great House	LA34245
North Road		
Pueblo Alto	Great House	LA661
Kin Indian Ruin	Great House	LA40402
N-48	Avanzada	LA34298
Pierre's Unit "C"	Herradura	LA35423
El Faro	Great House	LA16515
Kin Bi Dagas Tso	Great House	LA16508
Kin Bi Dagas Chii	Great House	LA16509
N-1	Avanzada	LA16520
Burned Jacal	Herradura	LA34304
Halfway House	Zambullida	LA15191
Gallegos Crossing	Avanzada	LA34303
N-8	Avanzada	LA34307
Upper Kutz Canyon	Avanzada	LA34305
Lower Kutz Canyon	Avanzada	LA34306
Penasco Blanco to Ah-shi-sle-pah Road		
Vivian's Stairway	Masonry Steps	-------
Los Aguages	Zambullida	LA34320
Ramp	Ramp	LA34324

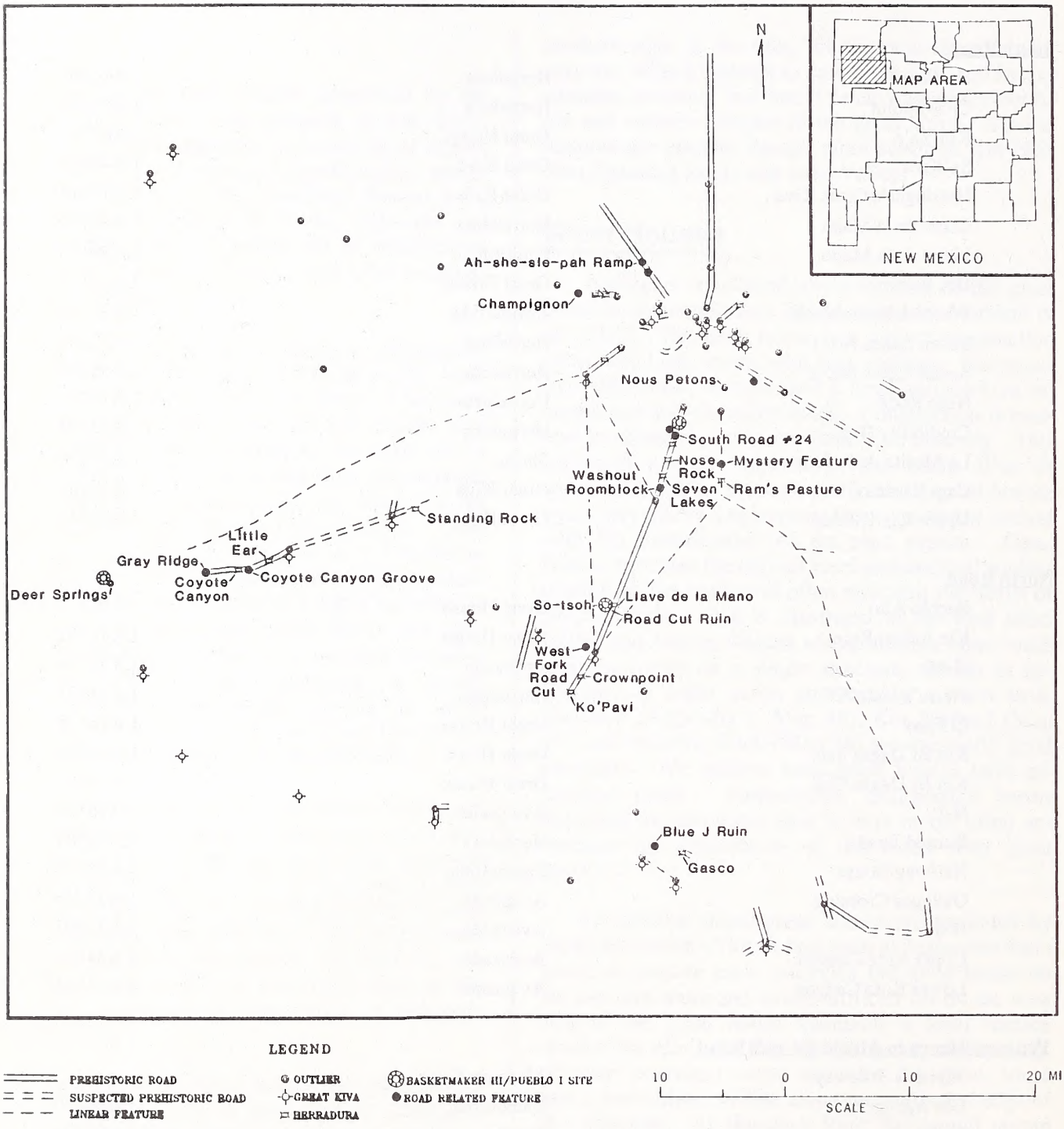


FIGURE 3

SELECTED ROAD RELATED FEATURES

Additional evidence of prehistoric landscape modification was noted in the Muddy Water community. Although some of these excavations appear to have been shallow quarries, others are in materials not suitable for building stone, and are not obviously road-related. The purpose of these excavations remains obscure.

Great Kivas

The great kiva is an eastern Anasazi architectural form which appears during the Basketmaker period in approximately the sixth century A.D. The evolution of the great kiva has not been described in detail; however by the 11th century the structures became quite formal, varying from about 12 to 25 meters in diameter. The development of Bonito style surface architecture appears to have been in response to the functional elaboration of the great kiva. The physical/spatial relationship between the great house and the great kiva is variable. Most often the great kiva is contained within a plaza or otherwise articulate directly with a great house structure, as at Haystack, Allentown, or Kin Bineola. In certain instances the great kiva is located a short distance from the great house as at Padilla Well, Kin Ya'a and Muddy Water. In these instances a road usually links the great house with the great kiva. Other examples of roads articulating with great kivas include Haystack (Appendix I, Map 48), the West Road at Penasco Blanco (Map 43), the East Road at Pueblo Pintado and the west fork of the South Road at Kin Ya'a (Map 2). Great kivas of mid-11th and 12th centuries should always be considered potentially road-related.

Herraduras

The Phase II investigation determined that herraduras were almost always built in a patterned relationship to the Chacoan road network. Although these structures were limited in extent, their consistent location at major breaks in topography and direct articulation with, or very close proximity to, the road surface makes this structural class the most useful in the identification and documentation of the roads in areas between great houses. The formalization of the road surfaces (e.g. construction) and patterned relationship of architectural features extended beyond the boundaries of the Basin floor, as indicated by documentation of the Gasco Herradura in the Red Mesa Valley (Appendix I, Map 49), Coyote Canyon and Little Ear Herraduras on the Peach Springs to Grey Ridge Road (Maps 35 and 37), and Crownpoint and Ko'Pavi Herraduras on the South Road (Map 1). In fact, the formal characteristics of the Gasco Herradura suggest roadways possibly were more formalized in the heavier populated areas of the periphery than on the Basin floor. Although herraduras are discussed in some detail in the Chaco Roads Project Phase I report (Kincaid, Stein and Levine 1983), the documentation of additional locations in Phase II allowed a re-evaluation of the identification criteria and their utility to Chacoan road studies. Basic structural information is presented for 28 features at 19 separate locations in Table 2. A summary of observations of herraduras made during the Phase II study are as follows:

1. Shape and Dimension: Herraduras are consistently circular to horseshoe-shaped and range in diameter from a minimum of 3.5m to a maximum of approximately 12.0m, with 5.0m to 7.0m most common. There are exceptions to this rule, such as Pierre's Unit C (Stein and Levine 1983:C-9), which is square in shape but fits all other herradura criteria.

2. Multiple Structures: At least five locations consist of multiple herradura structures. Two of these situations, the Poco site (Stein and Levine 1983:C-7) and the Coyote Canyon site (Appendix II, LA 38453), exhibit structures composed of clusters of two or more contiguous herradura features. Normally multiple features will flank a roadway such as seen at Ram's Pasture (Appendix II, LA 38111). In the more elaborate situations, however, a spur of the road may enter the herradura complex as at Poco and possibly Nose Rock (Appendix II, LA 14787). The finding of multiple structures at herradura locations south of Chaco Canyon has resulted in a re-evaluation of the differences between the herradura and zambullida structural classes (Kincaid, Stein, and Levine 1983). It is now believed structures such as Poco and Unit "C" at Pierre's may be classified as herraduras.

3. Orientation: 15 of the 25 documented features have an easterly orientation. Although the structures often appear to open onto the road surface, it seems that preference for an easterly orientation overrides opening the structure onto the road. Ideally, herraduras open to the east and onto the road surface.

4. Location: Herraduras are consistently located on major breaks in topography where extended visibility in both directions along the roadway is assured. Exceptions are the Llave de la Mano Herradura (Appendix II, LA 38109), where visibility from the structure itself is oriented toward the south and the Mystery Feature (Appendix II, LA 38112), which may not be an herradura. It should be emphasized that although all herraduras are found on topographic breaks on a road alignment, not all topographic breaks support an herradura. There seems to be no distinction between major and minor topographic breaks in the selection of herradura loca-

TABLE 2

DOCUMENTED HERRADURAS

Site Name	LA Number	Shape	Orientation	Minimum Dimension	Maximum Dimension	Road Association
Credibility Gap	34233	Horseshoe	East	7.0 m	7.0 m	
Nose Rock "A"	14787	Horseshoe	SE	5.0 m	6.0 m	South
Nose Rock "B"	14787	Irregular	East-SE	8.5 m	12.0 m	South
Seven Lakes "A"	38104	Oval	NE	4.0 m	5.5 m	South
Seven Lakes "B"	38105	Circular	East	5.0 m	5.0 m	South
Llave de la Mano	38109	Teardrop	East	6.5 m	10.0 m	South
Poco Feature 1	41010	Circular	East	6.0 m	6.0 m	Chetro Ketl to Escavada Complex
Poco Feature 2	41010	Circular	Unknown	7.0 m	7.0 m	Chetro Ketl to Escavada Complex
Poco Feature 3	41010	Circular	North	6.0 m	6.0 m	Chetro Ketl to Escavada Complex
Poco Feature 4 "A"	41010	Circular	Closed	6.0 m	6.0 m	Chetro Ketl to Escavada Complex
Poco Feature 4 "B"	41010	Circular	SE	8.0 m	8.0 m	Chetro Ketl to Escavada Complex
Poco Feature 4 "C"	41010	Circular	Closed	8.0 m	8.0 m	Chetro Ketl to Escavada Complex
Pierres Unit "C"	35423	Square	West	5.5 m	5.5 m	North Road
Burned Jacal	34304	Unknown	Unknown	Unknown	Unknown	North Road
Rams Pasture "A"	38111	Circular	East	5.0 m	5.0 m	None
Rams Pasture "B"	38111	Hook	NW	4.0 m	6.5 m	None
Mystery Feature	38112	"U"	West	3.5 m	4.0 m	None
Casa del Rio	35415	"D"	East	3.5 m	5.0 m	Casa del Rio to Lake Valley
Lake Valley	17222	Circular	East	5.5 m	5.5 m	Casa del Rio to Lake Valley
Yellow Point	35417	Horseshoe	ESE	4.0 m	5.0 m	Kin Klizhin to Kin Bineola
Gasco	14878	Oval	East	6.5 m	9.0 m	Unnamed
Little Ear	38457	Arc	East	3.5 m	5.5 m	Peach Springs to Grey Ridge
Coyote Canyon A-1	38453	Circular	Closed	4.0 m	4.0 m	Peach Springs to Grey Ridge
Coyote Canyon A-2	38453	Oval	Closed	4.0 m	5.0 m	Peach Springs to Grey Ridge
Coyote Canyon B	38453	"C"	East	5.0 m	5.0 m	Peach Springs to Grey Ridge
Crownpoint	46009	Oval	SE	7.0 m	10.5 m	South
Ko Pavi	46008	Horseshoe	SE	5.0 m	6.0 m	South
Standing Rock	47857	"C"	East	4.0 m	10.0 m	None

tions. The frustration potential for this type of patterning is obvious, requiring the examination of all topographic breaks along the alignment. This is discussed in more detail later in this report.

5. Angle Changes and Intersections: By virtue of their location with respect to the topography and the roads, herraduras often mark the location of a subtle bearing change of a roadway. These bearing changes are usually discernible from the ground perspective only by using a compass. On rare occasions the herradura is located at the intersection of two roads, such as at the Casa del Rio Herradura (Appendix I, Map 42).

6. Road modification: Phase II results suggest that formal excavation of a road surface resulting in a deep, bermed, visible roadway depression is often characteristic of herradura locations. An obvious example is the Gasco Herradura (Appendix II, LA 14878), where the road surface is deeply excavated into bedrock and the spoils from the excavation used in both the berms and in the structure itself. There is a tendency for the roadway near herraduras and in otherwise deeply excavated segments to narrow somewhat, often being approximately six meters in width.

7. Material Association: Herraduras are associated with low-density surficial scatters of ceramics. Scatters are usually in the roadway within approximately 50m (occasionally further) of the structure. Lithic materials in the vicinity of an herradura are rare, and grinding implements such as manos and metates have not been found at herradura locations. Although the density of ceramic material in association with the structures is low, it invariably represents a marked increase over that on the road in general. Formal middens have not been found in association with herraduras.

8. Temporal Association: Virtually all known herraduras appear to represent late 11th and early 12th century construction. In the southern quadrant of the Basin some Red Mesa Black-on-white and banded utilityware is usually found in association with Gallup-Excavada Black-on-white and carbon-painted whitewares at the documented herradura locations.

9. Other Structural Characteristics: Herraduras appear to be an aspect of the Bonito style architectural tradition of massive low masonry walls which appears late in the Chaco sequence. The complex wall system at Pueblo Alto and the connecting walls at Poco are characteristic of this architectural tradition. The walls may be a result of the increased formalization of the roads. It is not known whether the low masonry walls of the herraduras supported a superstructure. It seems unlikely that formal superstructures of jacal would have been utilized when stone was almost always available, although the Burned Jacal site on the North Road (Stein and Levine 1983:G-53) is suggestive in this regard. It is possible that brush was used to form a renewable superstructure, however, it is likely the structures were intended to be enclosures only.

10. Potential for Additional Herradura Locations: Projection of the extent of the Chacoan road system suggests only a fraction of existing herradura structures were located and recorded. Previously documented herradura-like structures not described here include the Las Ventanas stone circle (Marshall et al. 1979:192) and the "shrine" at Skunk Springs (Marshall et al. 1979:112-113). Several other poorly documented features may be herraduras such as the suspected structure on the Pueblo Pintado to Chaco Road (Morrison 1982, personal communication), a circular feature on the Kin Nizhoni to El Rito Road (Gauthier 1982, personal communication), an herradura-like feature sighted during aerial reconnaissance on a projected alignment of the Chacra Face Road near Mesa Cortada and an herradura-like feature along the Zuni Salt Lake trail south of Atarque Lake (Marshall and Kight 1983, personal communication).

In conclusion, herraduras are the most useful structures with regard to their patterned relationship to the roads. The Phase II crew relied heavily on the presence of herradura features for extending known roads and verifying potential alignments. Confidence in the consistent relationship of herraduras to roads was developed as a result of both locating herraduras by following imaged ground-visible roadways (e.g. the South Road) and locating roads that are not easily ground-visible by first finding an herradura.

For example, the Kin Klizhin to Kin Bineola Road is not conspicuously ground-visible but the Yellow Point Herradura (Appendix I, Map 40) was documented on a projected alignment and the road was presumed real on that basis. Subsequent low-sun-angle aerial reconnaissance showed a clearly visible roadbed depression articulating with the structure. Since road construction is normally associated with herraduras, this fact reduces the possibility of confusing this type of road-related architecture with other Anasazi and Navajo constructions.

The consistent location of herraduras on topographic breaks is an invaluable aid in developing a cost-effective means of verifying an imaged or projected road alignment. In situations where a road does not image, or other verifying characteristics are not visible or present on the ground, the presence of

an herradura is deemed sufficient evidence to verify the prehistoric age of the road segment. It must be emphasized, however, that the absence of an herradura on the alignment for long distances (14.5 kilometers) may not in itself be sufficient evidence to discount the prehistoric origin of a specific segment or road system.

Herradura locations often represent subtle angle changes in a roadway and on rare occasions the intersection of two roads. When the exact alignment of a roadway was not certain, the Phase II strategy was to prescribe an arc from a known herradura to a modeled target area five to eight kilometers distant. If a survey of the target area within the arc did not produce an herradura or other evidence for the road alignment, the same procedure was repeated for the next major horizon line and so on until either an herradura was located, there was other evidence to indicate that the road passed within the arc, or it was decided that the road angled in a different direction.

Avanzadas

The term avanzada is restricted to limited constructions which sometimes occur adjacent to a road surface and are sometimes elevated above it, but are not articulated with it. Because of the limited knowledge of road functions and architecture indirectly related to the roads, the avanzada becomes a catch-all category for minor architectural perturbations in the vicinity of prehistoric roads.

Seven structures fitting the criteria for avanzada were documented during Phase I of the roads project. All but one of these were associated with the North Road. Because avanzadas are known to occur in unusual topographic situations near a road (i.e. Gallegos Crossing, Kutz Canyon Overlook), there is a strong possibility that these are variations of the herradura type. The presence of such a minor architectural form aids in the location of a prehistoric road. No new sites of the avanzada type were located during Phase II.

Zambullidas

Zambullidas have been defined (Kincaid, Stein and Levine 1983) as being lesser structures than great houses, but a more sophisticated architectural form than herraduras. In actuality the zambullida possesses characteristics of both. Certain zambullidas classified in the Phase I report may be considered as "fancy" herraduras in that they are located in elevated situations of high visibility, they articulate with a constructed length of roadway, and they are circular to horseshoe-shaped in form.

Kimbeto Point (Stein and Levine 1983:C-49), Los Aguages (Stein and Levine 1983:C-2), and Halfway House (Stein and Levine 1983:C-11), on the other hand, are rectangular in form, may have been roofed, contain contiguous rectangular cells or rooms, but lack the housed surface kiva characteristic of the great house. Because of the lack of the kiva these structures were classified as zambullidas. The absence of this conspicuous feature suggests functional differences between the zambullida and great house. Zambullida-type features incorporate selected characteristics of the great house and the herradura (structural and locational). Zambullidas articulate directly with the road surface, as do herraduras. Only one zambullida, Washout Roomblock (Appendix II, LA 38106) on the South Road, was recorded during Phase II.

Road Construction

Constructed portions of roads were noted in a number of areas during this study. Most construction features are similar to those seen on the North Road, Penasco Blanco-Ah-shi-sle-pah Road, and northern portion of the South Road during Phase I investigation.

The most common form of construction is excavation to a compact substrate. Excavation of the roads is normally evidenced by the presence of a roadway depression in combination with an adjacent low berm or berms. Berms can normally be recognized only when they include pebbles, concretions, or clasts which resist erosion. Because of this they are most frequently found in relatively flat areas with a thin mantle of unconsolidated sediments overlying flaggy sandstone bedrock. In most instances the berms were mixed earth and rubble, although an excellent example of a rubble berm was observed near the Gasco Herradura (Appendix I, Map 49). The Kin Ya'a West Fork Road Cut (Appendix II, LA 40015) is another example of massive earth removal associated with road construction.

Curbs, walls and other features indicating a high degree of formalization were not observed during Phase II investigations, except perhaps near the Coyote Canyon Herradura (LA 38453). However, other features indicating construction included a groove resembling the one near Pueblo Alto (Appendix II, LA 38454), three cairns found along the Coyote Canyon Road (Appendix I, Maps 35, 36, and 37), stairs pecked into bedrock near the Crownpoint Herradura (Appendix I, Map 1), road leveling (Map 1, Map 36), excavation into a Basketmaker structure (LA 38107, Map 3), and a possible raised roadbed at Muddy Water (Map 52).

Earthworks

Observations made during Phase II indicate that the surface of the prehistoric road is characteristically formalized to a greater degree as it passes or articulates with great kivas, great houses, and herraduras. Extensive formalization of the road is common as it enters the vicinity of a great house or great kiva. In numerous instances, such as at Holsinger's Great Kiva west of Kin Ya'a (see Appendix II, LA 40015), Kin Ya'a, Muddy Water, Haystack, Penasco Blanco, Lake Valley, Standing Rock and possibly others, the roads are flanked by massive linear spoils piles which are here described as earthworks. These features often contain trash and have traditionally been described as trash mounds (e.g. Middens 1 and 2 at Kin Ya'a described by Marshall et al. 1979:209). However, the size, placement, and composition of these features are dissimilar to normal midden deposition and we believe they represent deliberately constructed architectural features.

These earthworks have not gone entirely unnoticed. For instance, in the 1930s Haury questioned the "naturalness" of the large mound east of Casa Rinconada (Morrison personal communication). Other such mounds are the two earthen constructions paralleling the front wall at Pueblo Bonito which were actually contained by retaining walls (Judd 1964) and the "trash" mound at Pueblo Alto (Lekson 1981, Windes 1982). Similar earthen constructions have been reported from Casas Grandes (Di Peso 1974:431) and are a normal element of Hohokam architecture between A.D. 500 and 1100 (c.f. Haury 1976:80-94).

Several notable characteristics serve to distinguish the earthworks from "normal" midden mounds. The size of the mounds is usually much larger than would be expected for normal domiciliary refuse. For example, one of the four mounds near Kin Ya'a has over a meter of relief and is more than 20 meters in diameter. Although the mounds superficially resemble middens since they have large quantities of ceramics at the surface, the ceramics are almost the only component common to these mounds. There is usually a pronounced lack of ash, charcoal, burned bones, and other components of a "normal midden." Limited quantities of ground, pecked or otherwise modified construction stone were noted in almost every earthwork. The quantity of rock debris in the earthworks is variable, but in none of the earthworks observed did the rock to soil ratio exceed 1:1. Ratios of approximately 1:3 or less were more common. Much of the rock debris was angular, suggesting construction debris, but some of the stones had a calcium carbonate coating on all sides, indicating that all the stones were not ordinary trimming spalls.

Another characteristic of the earthworks which distinguishes them from midden mounds is the large quantity of fine-grained sediment matrix. Although mechanical analysis of mound sediment was not performed, field texture tests from the surface of the earthworks usually indicated a sandy loam texture. The texture appeared to vary slightly, correlating with the dominant soil textures in the general area, although this was not exhaustively tested. This sediment does not appear to have been merely scraped from the surface in some other location, for an unusually large quantity of hematite concretions is normally present. These concentrations, usually of small to medium pebble size, are ordinarily concentrated near the bedrock/soil boundary in undisturbed context. The suggestion is that the sediments of the earthworks, in large part, were derived from excavations deep enough to come close to, if not penetrate bedrock.

The function of the earthworks and the source of materials has not been conclusively demonstrated at the present time. It is clear that the earthworks are not middens in the ordinary sense, nor are they composed of normal construction debris. Most characteristics indicate that a large volume of the materials composing the earthworks are deliberately excavated and emplaced.

In almost every instance the earthworks are in positions marginal to roads accessing the sites. The mounds are elongated along the roads at some sites, resembling large exaggerated berms adjacent to the roads. This may be seen at Peach Springs (Appendix I, Map 37), Haystack (Map 45), and Standing Rock (Map 48), among others. In sites that have a low or open side, the earthworks are usually present on the open side of the site, such as at Kin Ya'a (Map 2) and Peach Springs (Map 37). Occasionally the earthworks stand by themselves, some distance from any Bonito style structure, as at Muddy Water (Map 52) or near Casa Rinconada in Chaco Canyon.

The source of the sediments is not known with certainty. If the material originated as construction debris, one could expect a high proportion of angular rock fragments, and a relatively low proportion of fine-grained sediment, which is not the case in the earthworks observed. Although some of the rock material has been modified, in every instance there was a large percentage of rocks that showed no obvious indications of modification. It seems highly unlikely that the fine-grained sediment was carried into the site for the purpose of mortar manufacture. Although it is possible that some of the material may have originated in this way, the massive quantities present in the earthworks, along with the admixture of stone and hematite concretions argue against this

origin for most of the material. Observations of original mortar reveals the occasional presence of hematite concretions, but not in the quantities normally present in the earthworks.

Several other possible sources of the materials within the earthworks may be postulated. Roads in the vicinity of earthworks are often readily visible and still retain a deep transverse profile. It is possible that material may have been excavated from the roads near the sites, with some of the excavated material transported to the earthworks and deposited there. If this were the case, one might expect to find the interior portions of the earthworks with less ceramic content than the surface. Another possible source of material for the earthworks is kiva excavation. This seems unlikely, for the quantity of material removed in the excavation of even great kivas is insufficient to provide the bulk observed in the earthworks mounds. Yet another possible explanation is that the mounds accumulated slowly through accretion, with the sediments being added over a period of time in the form of construction debris, offerings, or some other, yet unknown form. If this were the case, one would expect to find a relatively uniform distribution of ceramics within the interior of the mounds. It is possible that the sediments may have been derived from excavations in the vicinity of the site that were not road or kiva related.

Excavations such as those conducted by Windes (1982b) at Pueblo Alto may help resolve those issues. In addition, new excavations should be conducted with the objective of noting the spatial and chronological distribution of the sherdsroa in the sediments. A critical reappraisal of previously identified midden mounds, such as that currently being conducted by Windes, may provide information useful to the proper interpretation of the earthworks.

Platforms

Earth and rubble have been described as the construction technique for certain ramps and platforms which facilitate access into Chaco Canyon (Vivian 1983). In this circumstance the concept of "platform" implies a landing as the foundation for scaffolding or ladders. A significant variation on the theme of platforms is the structure documented herein as Llave de la Mano (Appendix II, LA 38110), a large earth and rubble construction which articulates with the South Chaco Road 5.4 kilometers north of Kin Ya'a.

Llave de la Mano appears to represent a massive rubble ramp and platform. Configuration of the mound suggests the incorporation of masonry steps leading up to a platform or landing where an herradura-like structure flanks the road alignment. (This situation is very similar to the relationship of Unit C at Pierre's Ruin to the ramp connecting the Acropolis with the North Road.) At Llave de la Mano a simple masonry stair leads upward from the platform to a bench which forms an elevated, natural platform overlooking the constructed platform.

Another less elaborate platform which resembles Llave de la Mano, was documented during the 1983 BLM coal leasing surveys north of Crownpoint (Fowler and Stein 1983). There, at Casa Papalote, a small platform with a parapet wall was constructed as a landing on the scarp below an unusual Bonito style structure. However, there is no evidence for a prehistoric road in association with this structure.

A different kind of platform is suggested by the configuration of the rubble mound at Lower Greenlee (Stein and Levine 1983:C-36). At this site a low platform appears to have been built as a foundation or border around the base of the Bonito style structure. The retaining wall flanking Aztec Ruin creates a similar effect.

Patterning

The issue of patterning of structural features along the roads is important, particularly with respect to the determination of the validity of an alignment via ground reconnaissance. Basic data on the spacing of architectural features along a road system is now available for 53 kilometers of the North Chaco Road and 43.4 kilometers of the South Chaco Road. These two road systems seem to be the major arteries linking Chaco Canyon with the San Juan Basin periphery. Because of this the relationship of architectural features to these arteries can justifiably be used as control for the comparison of other roads as they become better documented. Because we are not concerned here with a functional analysis of the spatial relationships of the architectural features but rather an evaluation of the efficacy of using road-related architecture for verifying or not verifying a segment of a road system, then only minimum and maximum distances will be a matter of concern.

Table 3 presents a list of known features, their structural/functional classification and distance from one another. Because only these structural types which consistently articulate with the road surface can confidently be used as road indicators, only distances between these types of structures will be considered (e.g. great houses, great kivas, zambullidas and herraduras). Because great houses do not necessarily pattern with respect to topography or other en-

TABLE 3

SPACING BETWEEN SITES ALONG PREHISTORIC ROADS

Site Spacing			Distance (in Kilometers)	Status
South Road				
Pueblo Bonito (GH)	to	Upper Kin Klizhin (GH)	11.4	Undocumented
Upper Kin Klizhin (GS)	to	Casa Patricio (GK)	1.3	Intensive survey
Casa Patricio (GK)	to	Credibility Gap (H)	3.0	Intensive survey
Credibility Gap (H)	to	Nose Rock (H)	4.4	Reconnaissance
Nose Rock (H)	to	Seven Lakes (H)	1.8	Reconnaissance
Seven Lakes (H)	to	Bee Burrow (GH)	2.8	Reconnaissance
Bee Burrow (GH)	to	Llave de la Mano (H, P)	14.4	Reconnaissance
Llave de la Mano (H,P.)	to	Kin Ya'a (GH), Kitowwi, (GK) & Sa'kwa (GK)	5.4	Reconnaissance
Kin Ya'a (GH,GK,H,P)	to	Crownpoint (H)	3.0	Reconnaissance
Crownpoint (H)	to	Ko'Pavi (H)	2.0	Reconnaissance
North Road				
Pueblo Bonito (GH)	to	Pueblo Alto (GH)	1.2	Undocumented
Pueblo Alto (GH)	to	Kin Indian Ruin (GH)	3.2	Partial Intensive Survey
Kin Indian Ruin (GH)	to	LA 34298 (A)	12.6	Intensive Survey
LA 34298 (A)	to	Pierre's Complex (GH, P, H)	1.0	Intensive Survey
Pierre's complex (GH,P,H)	to	LA 16520 (A)	.8	Intensive Survey
LA 16520 (A)	to	Burned Jacal (H)	11.0	Reconnaissance
Burned Jacal (H)	to	Halfway House (2)	4.0	Reconnaissance
Halfway House (2)	to	Gallegos Crossing	3.2	Reconnaissance
Gallegos Crossing (A)	to	LA 34307 (A)	9.8	Reconnaissance
LA 34307 (A)	to	Upper Kutz Canyon (A)	.2	Reconnaissance
Upper Kutz Canyon (A)	to	Lower Kutz Canyon (A)	.8	Reconnaissance
Lower Kutz Canyon (A)	to	Twin Angels (GH)	4.4	Reconnaissance
Twin Angels (GH)	to	Salmon Ruin (GH, GK)	16.2	Undocumented

vironmental variables, spacing between these structures is an important consideration.

Six Bonito style structures are known on the North Road if Salmon Ruin and Pueblo Alto are included. The 16.2 kilometer distance between Salmon Ruin and Twin Angels Ruin is incompletely documented and is not considered here. The area south of Twin Angles Ruin and north of Pierre's Ruin has been walked but not intensively. This segment of roadway will be included but with reservations, presuming that most major road-related features have been identified. The 15.1 kilometer length of the roadway between Escavada Wash and Pierre's Ruin was intensively surveyed during Phase I of this project. The remaining 3.7 kilometers south of the Escavada to Pueblo Alto will be considered here although it was not visited by this project.

Five locations of major architectural features are known between Pueblo Alto and Twin Angels Ruin including six great houses and a zambullida. No great kivas are known to be associated with the North Road, possibly due to the small population in the portion of the Basin immediately north of Chaco Canyon. Distances between major structures range from 5.2 kilometers from Pueblo Alto to Kin Indian Ruin to 21.6 kilometers from Halfway House to Twin Angels Ruin. Taking lesser structures into consideration, distances range from 3.2 kilometers between Halfway House and Gallegos Crossing to 13.6 kilometers from Kin Indian Ruin to Pierre's Complex.

To date only six kilometers of South Road has been systematically documented. An additional 37.4 kilometers was informally walked on this phase of the Roads Project. In essence the length of the South Chaco Road from Upper Kin Klizhin to Kin Ya'a and beyond to the headwaters of the Rio Puerco of the West has been examined for road features. Five major structural manifestations are associated with the South Chaco Road including three great houses and great kivas (the Pueblo I great kiva, Casa Patricio, is excluded because it cannot be conclusively related to the Chacoan Road). Distances between structures are 13.3. kilometers between Upper Kin Klizhin and Bee Burrow and 19.8 kilometers between Bee Burrow and Kin Ya'a. Six herradura locations which include eight individual structures are documented for the South Road. Distances between these features range from 1.8 kilometers between the Nose Rock Herradura and Seven Lakes Herradura to 17.2 kilometers between the Seven Lakes and Llave de la Mano Herradura. Considering the spacing of both great houses-great kivas and herraduras, the maximum distance between features is reduced to 14.4 kilometers between Bee Burrow and the Llave de la Mano Herradura.

Spatial patterning of major architectural features is introduced here to point out problems inherent in "spot-checking" a road system for the purposes of verification. The figures presented here demonstrate that relatively great distances can exist between diagnostic structural aspects of a Chacoan Roadway. As mentioned earlier, patterning and consistent topographic location of the herradura structure is invaluable in projecting and verifying a prehistoric roadway. The reverse is not true however in that the absence of a herradura on a seemingly promising topographic situation cannot alone invalidate a linearity which is under investigation. Needless to say 14.4 kilometers of negligible evidence for a roadway is enough to put a strain on even a seasoned archeological surveyor. This is not uncommon even on the most ground-visible of roads. Just this situation was partially the justification of the corridor survey approach used on Phase I of this project (Stein and Kincaid 1983). Intensive survey will allow a surveyor to evaluate material culture distribution and other subtle forms of information which combine to reinforce confidence that the surveyor is on or not on the prehistoric alignment.

PHASE II RESULTS

The following section summarizes our findings about particular prehistoric roads. Specific observations which support these findings and which provide additional detail are presented in the annotated maps which comprise Appendix I. These maps are referenced in the summaries which follow. In addition, Appendix II includes more detailed information about architectural features found during Phase II of the Chaco Roads Project. Sites described in Appendix II are referred to by LA number in the text.

- **1. South Road (Maps 1 through 9)**

The southernmost known segment of the South Road is on the Dutton Plateau 5.2 kilometers south of Kin Ya'a. From there the South Road connects Kin Ya'a, Bee Burrow, and Upper Kin Klizhin. From Upper Kin Klizhin it presumably continues into Chaco Canyon via South Gap, although this segment has not been documented. This road contrasted with the imaged Southeast Road and the Kin Ya'a to Ruby

Wells Ranch Junction Road in that it was consistently well defined from both the ground and aerial perspectives, it exhibited clear evidence of deliberate construction at a number of points along its route, and it was associated with road-related features and artifact scatters. The South Road is believed to have been the major formalized access to Chaco Canyon from the southern part of the San Juan Basin.

Our examination of the South Road included aerial photograph interpretation and aerial reconnaissance of segments between Kin Ya'a and Upper Kin Klizhin. Low-sun-angle photography was also taken along this route at a scale of 1:12,000. This photography was not available until after the close of the field season and has not been fully interpreted. Ground observations were made during Phase I along segments from Upper Kin Klizhin to a point about four miles south of that structure. During Phase II we inspected on the ground all imaged and projected segments from that point southward to Kin Ya'a.

These investigations resulted in the recognition of deliberately constructed earthworks at Kin Ya'a, as well as discovery of Kitdauwi (Holsinger's Great Kiva) at Kin Ya'a. Between Kin Ya'a and Bee Burrow was the Llave de la Mano Herradura (LA 38109), Llave de la Mano platform (LA 38110), and So'tsoh Basketmaker III village (LA 38108). The latter is not a road-related site but the South Road does bisect one of the Basketmaker III structures (Road Cut Ruin, LA 38107) associated with So'tsoh Village. Clear evidence o road construction was observed at this and several other locations between Kin Ya'a and Bee Burrow. It was also possible to follow the South Road in several places by monitoring sherd densities, even though the road was not otherwise ground-visible.

Along the 6.5 kilometers of road inspected north of Bee Burrow were the two Seven Lakes Herraduras (LA 38104 and LA 38105) and Nose Rock Herradura (LA 14787). A six-room roomblock (LA 38106) was also found very near the road in this area, although there was no evidence linking it to the roadway. Several examples of clear construction, visible swales and linear sherd scatters were also found north of Bee Burrow.

The area south of Upper Kin Klizhin was not rechecked on the ground, since this area was well documented during Phase I. However, through low-sun-angle photography and aerial reconnaissance, a fork in the South Road was observed just north of Casa Patricio. The westernmost segment is presumably the main alignment to Chaco Canyon, but the eastern fork deviates very slightly to pass near the ruin of Upper Kin Klizhin.

The South Road is definitely a formal, constructed prehistoric road. Approximately .6 kilometers of the projected alignment passes through the Crownpoint Northeast coal leasing tract. These segments were recorded in detail during the 1983 BLM coal tract survey (Fowler and Stein 1983) and have since been excluded from the coal leasing tract.

- **2. Kin Ya'a to Ruby Wells Ranch Road (Map 2, Maps 10 through 15)**

This road was previously identified by photointerpretation, and was not extensively ground-checked prior to Phase II investigations. The only known site on the road alignment is Kin Ya'a. Our investigation of this road involved the use of aerial reconnaissance and ground observation, as well as photointerpretation of SCS conventional and BLM low-sun-angle photography. Approximately 11 kilometers of the projected alignment were examined on the ground, concentrated on the north and south ends, with additional spot checks between.

Examination of low-sun-angle aerial photography (1:24,000) confirmed the presence of photolineations which in some areas possessed the photo-characteristics of prehistoric roads. The photolineations are straight or curving in most cases. Close inspection of the low-sun-angle photographs however, seemed to indicate the deviation of the road for dunes in several areas, a characteristic atypical of prehistoric roads. Other indications of historic origin for this feature were found in a badland area approximately eight kilometers northeast of Kin Ya'a. In this area the road curves around topographic features and displays other characteristics of an historic road.

Ground examination of the area approximately three kilometers north of Kin Ya'a revealed the presence of a broad, deep roadbed depression similar in appearance to many prehistoric roads. The depression, approximately six meters in width (accentuated by visible erosion), contained numerous historic artifacts, many of which could have been derived from a Navajo site upslope from the road. One portion of the road in this location contained faint traces of ruts. Eight sherds of a Gallup vessel were on the alignment in this location. These sherds were found in an area approximately one-half meter square, and most could be fitted together. The sherds obviously represented the breakage of a single vessel or vessel fragment. No other artifacts of prehistoric origin were found on the entire examined length of the projected alignment. This location also contained several obviously historic roads which paralleled the imaged alignment. Ruts and historic artifacts were found in

several other locations in the southern eight kilometers of the alignment.

The northern terminus of the projected alignment was extensively examined on the ground on several occasions. No visible swales, artifacts, or any other indication of a prehistoric road were found in this location. In addition, the imaged junction with the Southeast Road is in an atypical position for prehistoric road junctions – a low area with restricted visibility. No prehistoric structures were found on the projected alignments, nor was there any indication of any prehistoric activity.

In summary, despite the superficial resemblance in places to a prehistoric road, the almost total absence of Anasazi artifacts and road-related sites, and the presence of ruts, parallel historic segments, deviation for minor topographic features, and historic artifacts lead to the conclusion that the photolineations represent an historic road.

- **3. Southeast Road (Maps 15 through 34)**

This road was previously identified on the basis of photointerpretation only, and was not extensively ground checked prior to Phase II investigations. The road was believed to pass from Upper Greenlee Ruin to a road junction in the vicinity of Ruby Wells Ranch and then to extend southeastward, terminating at San Mateo Ruin. Many of the photointerpreted segments of the road were identified as speculative by Obenauf, and there were major gaps in several areas between imaged segments.

Conventional aerial photography used in the search for this road included the SCS, USGS, and BLM-ARS sets. In addition, the BLM obtained low-sun-angle aerial photography for this road. Two parallel flightlines were flown at a scale of 1:24,000 with sidelap centered approximately on the previously imaged alignment.

Re-examination of the conventional aerial photography confirmed the existence of photolineations, but many of these could not be seen on the low-sun-angle photos. Furthermore, during aerial reconnaissance only a single apparent road segment near San Mateo Ruin could be seen.

Intensive ground examination was possible for the southern portion of the road, for most of the northern half of the road, and for a short segment within the Lee Ranch coal leasing tract. In addition, existing inventory information for the Lee Ranch tract (Beal 1980, 1981; Dulaney and Dosh 1981) was studied in a search for elongated artifact scatters (cigars), herraduras, and other road-related site types and for linear patterns of site distribution which might reflect a prehistoric road.

These efforts verified a road segment which extends approximately one kilometer northward from San Mateo Ruin, and resulted in discovery of the Rams Pasture Herradura (LA 38111) and the Mystery Feature (LA 38112) seven kilometers south of Upper Greenlee Ruin. Despite exhaustive efforts, the road could not be located elsewhere by road-associated sites, sherd or other artifactual distributions, construction features, or other physical characteristics. Possible alternative routes to Borrego Pass, San Lucas Pass, and Ambrosia Lake were explored by several aerial reconnaissance flights, photointerpretation, and field examination, but all proved fruitless. The imaged alignment and possible alternative routes were barren of any type of archeological materials or manifestations.

The prehistoric road segment north of San Mateo can be traced northward for about one kilometer, ending at a "convergence" with an historic road. This segment shows well on aerial photographs and could be easily seen during aerial reconnaissance. It is ground-visible and included both sherd scatters and berms which indicate deliberate construction of a road approximately 8.5 meters in width. Between this segment and the Lee Ranch boundary to the north, all imaged segments appear exclusively historic. No structural sites were found along the imaged alignments in this area. Ceramic scatters do occur north of the verified road segment, but the alignment contained no road-related artifacts. In summary, we found that the Southeast Road can be traced no more than one kilometer northward from San Mateo Ruin. The remainder of this alignment is not confirmed as a prehistoric feature.

The presence of Rams Pasture Herradura near the northern end of the Southeast Road suggests a former route of travel in the general area of the alignment. There are four possible explanations for the lack of visibility on both aerial photographs and the ground:

a. The road never existed.

b. The road existed as a formalized road, but has since been totally obliterated by secondary processes. This is thought to be highly unlikely.

c. The road existed, but was not formalized and is therefore not amenable to preservation.

d. The wrong places were examined. The presumed end members may not have connected with

each other, but rather with other presently unknown locations.

A possible alignment of the road connecting with Kin Nahzin was also examined on the ground (see Maps 22 and 23). A photolineation imaged particularly well just west of this site, but ground examination revealed only several probable historic quarry areas.

• 4. Coyote Canyon Road (Maps 35 through 37)

This road, which had been previously photointerpreted, was examined by aerial reconnaissance, ground observation, and reinterpretation of existing USGS and SCS aerial photography.

Low-sun-angle aerial reconnaissance showed a previously interpreted segment between Peach Springs and Grey Ridge as an easily seen, broad, shallow swale, which appeared to fit the criteria for a prehistoric road. As a result of the aerial reconnaissance, a segment of the road was delineated to be ground surveyed (see Maps 36 and 37). The geology and topography in this area are ideal for preservation as the area consists of a shallow, sandy mantle overlying sandstone bedrock.

Analysis of topography prior to ground survey resulted in the selection of two target areas which appeared favorable for herradura locations. These two target areas were major divides which appeared to offer long vistas up and down the road. Subsequent fieldwork showed that herraduras are, in fact, present at both locations exactly as predicted.

The investigated segment of the Peach Springs to Grey Ridge roadway exceeded our expectations in ground visibility. The segment walked was ground-visible for over four kilometers, and this section proved to be one of the best examples of constructed roadway known from the Chacoan road network.

Within the area surveyed are 14 separate instances of obvious construction. These were in the form of excavation through low ridges or into sandstone, and a massive road-leveling effort in which the road was incised into a side slope, with the back dirt piled on the downslope of the road in order to maintain a level surface (positive-negative transverse profile). This leveled segment was approximately 100 meters in length. Width of the road was consistently 10 meters, the swale averaging .30 meters in depth, and the roadway was often defined by berms which appeared as disturbed substrate on the borders.

Material association consisted of a sparse but relatively uniform scatter of ceramic materials which could be traced over most of the distance surveyed. Sherd density increased noticeably in the vicinity of the herraduras. No other Anasazi manifestations were observed except in the vicinity of Grey Ridge, allowing a confident presumption of the association between the sherd scatter and the road alignment. Other features demonstrating Anasazi use of the roadway included two herraduras (LA 38453 and LA 38457), three cairns (Maps 35, 36, and 37), a groove (LA 38454), and a stairway (recorded with LA 38454). An enigmatic compound (LA 47856) apparently dating to the 13th century was found on the road alignment, although its relation to the road is still a matter of conjecture.

Portions of the Peach Springs to Grey Ridge Road were sufficiently clear on the 1969 USGS aerial photography to suggest it may have been the right-of-way for a former route of Navajo Highway 9, which presently parallels the course of the imaged alignment. Examination of SCS imagery, however, reveals the roadway had clearly fallen into disuse when the imagery was taken in the 1930s, suggesting that there was no relationship between the highway and photolineation. There was no evidence to indicate the roadway was used during historic times. One turn-of-the-century site was located adjacent to the alignment in the vicinity of the groove and some other early historic trash was found in the vicinity of the Navajo settlements at Grey Ridge. There were no historic artifacts on any other portion of the alignment. Purple glass, hole-in-top cans, and other artifacts of the same general period were absent from the material associated with the road. Rutting, braiding, and incised erosional characteristics of a wagon road were not observed on the alignment. In addition, the alignment was composed of straight, rather than winding, segments and maintained a consistent width at least twice as wide as expected of a wagon road. In summary, the Peach Springs to Grey Ridge roadway is clearly prehistoric in origin.

• 5. Standing Rock Area (Maps 38 and 39)

Several potential roads were identified in this area based on photointerpretation (Obenauf 1981) and ground survey (Marshall et al. 1979:233). A brief ground reconnaissance in this area confirmed that the imaged road leading north-northeast from Standing Rock Ruin is a prehistoric road flanked on both sides by massive artificial earthworks. This alignment was traced as far as Standing Rock Wash. On the opposite (north) side of the wash an unrecorded panel of petroglyphs was found, but no prehistoric road. The second imaged road trends northeast as it leaves the great house. This segment

is clearly visible in the immediate vicinity of Standing Rock Ruin, but quickly becomes quite subtle. Other imaged alignments in the vicinity of Standing Rock Ruin were not checked, and the work we did was cursory. Further ground observations are needed in this area.

Reconnaissance of potential herradura locations along a ridge about two miles east of Standing Rock Ruin resulted in discovery of Standing Rock Herradura (LA 47856). However, the feature is 200 meters from the supposed alignment of the prehistoric road. Re-examination of the previously reported road segments, including inspection of SCS aerial photography taken in the 1930s, suggests these are the remains of historic roads and are probably not associated with Standing Rock Herradura.

• 6. Kin Klizhin to Kin Bineola (Map 40)

Yellow Point Herradura was recognized as a road-related feature during Phase I investigations. However, no road segments were found during the initial ground reconnaissance. During Phase II this area was inspected by aerial reconnaissance. A one-kilometer segment of prehistoric road was clearly visible on the mesa immediately east of Yellow Point Herradura. The occurrence and location of this previously unreported road segment were accurately predicted by the presence of the herradura. This segment should be inspected on the ground.

• 7. Casa del Rio to Lake Valley Road (Maps 41 and 42)

The Casa del Rio to Lake Valley Road probably represents a segment of the Chaco West Road. This road is predicted to connect the eastern slope of the Chuska Mountains at Skunk Springs with Chaco Canyon via Penasco Blanco. The Casa del Rio segment is known primarily from the intervening area between the Casa del Rio Herradura and the Lake Valley Herradura. The roadway apparently bifurcates at the Casa del Rio Herradura with one alignment trending west and the other northwest. It is the western segment which articulates with the Lake Valley Herradura, two kilometers further west. The destination of the northwestern segment is not presently known.

Investigation of this segment of the West Road began in late 1977 when Michael Marshall examined 1:24,000 aerial imagery in conjunction with his studies at Casa del Rio. Marshall and Stein were able to ground check portions of the imaged alignment early in 1978. It was determined that the two swales on the mesa top west of Casa del Rio were prehistoric in origin. The Casa del Rio and Lake Valley Herraduras were also identified and documented. Later in 1978 Marshall and Stein were able to secure imagery of the area west of Casa del Rio at a scale of 1:3,000 as part of a contract with the National Park Service Remote Sensing Division. Gretchen Obenauf then examined aerial photography along this road and concluded that a link between Penasco Blanco and Casa del Rio would likely be lost in the floodplain of the Chaco River (Obenauf 1980:72).

The Casa del Rio segment was briefly examined during the reconnaissance portion of the Phase I Chaco Roads Project. As a result, two additional locations were identified which may be road-related. One, LA 35416, is located 1.6 kilometers west of Casa del Rio and is described in the Phase I report (Stein and Levine 1983:C-59). The other, named Champignon (LA 36639) after the shape of the sandstone pinnacle on which it is located, flanks the roadway northwest of the Lake Valley Herradura. Champignon is a curious structure resembling a refugee Mesa Verde manifestation in layout but associated with ceramics dating to the Classic Bonito Phase. The structure may be a "shrine" much like La Mesita de la Junta or its relationship to the Casa del Rio roadway may simply be fortuitous. Champignon is described in Appendix II of this report.

The Casa del Rio to Lake Valley Road is definitely a prehistoric feature. Not all imaged segments were ground checked, however, particularly the isolated segments to the northwest of the Casa del Rio Herradura. The destination of this alignment remains unknown pending more thorough ground examination. Both Casa del Rio and Lake Valley great houses exhibit earthen constructions in excess of normal midden deposition. Both these locations need to be re-examined.

The nature of articulation of the west road with Chaco Canyon remains unknown. Logically the road would parallel the floodplain of the Chaco and be lost. However, there is a possibility that the alignment may proceed to the Padilla Well Great House and enter Chaco through South Gap. Either or both situations are probable.

• 8. Padilla Well (Map 43)

During Phase II an aerial reconnaissance was flown over the site of Padilla Well. An apparent prehistoric road segment was observed, trending approximately in an east-west direction, tangent to the southern edge of the great kiva. To the west this segment projects into the great house, passing between two mounds which could be earthworks. Other alignments observed to the east look more like historic

roads on the aerial photography. This area should be inspected on the ground.

- **9. Ah-shi-sle-pah (Maps 44 through 46)**

This road was initially identified by Gordon Vivian and was the subject of several intensive investigations. During Phase I of the BLM Roads Project the Ah-shi-sle-pah Road was thoroughly documented between the Chaco and Ah-shi-sle-pah Washes. Despite concerted efforts, investigators were unable to extend the alignment beyond Ah-shi-sle-pah Wash by photointerpretation or ground reconnaissance.

During Phase II an early morning aerial reconnaissance was flown over this area and potential road segments were located both north and south of Black Lake. Surface inspection showed the swale south of Black Lake as an intermittently visible swale 12 meters wide. A ceramic scatter 300 meters long and 25 meters wide corresponded to this alignment, suggesting that it is a prehistoric road. Despite extensive archeological survey to the northwest along the projected alignment, however, no potential destination for this road was identified.

The projected alignment passes through several PRLA and competitive leases. Therefore it is recommended that low-sun-angle photography be flown on the projected alignments for PRLA lease NM 3752 and NM 3755 and adjacent competitive leases and be submitted with proposed mine plans for these leases.

- **10. Kin Nizhoni Complex (Map 47)**

Photointerpretation suggested that at least three, possibly four, roads lead to Kin Nizhoni. One road connects the upper and lower great houses, the second leads southeast in the direction of El Rito and San Mateo, and the third leads to the north. The fourth road leads to the southwest and is less visible on aerial photography. During aerial reconnaissance these roads were dramatically visible. The road leading north from Kin Nizhoni could be traced 1.5 kilometers. Ground reconnaissance showed the first three kilometers of the southeastern road and a short segment of the southwestern road were visible as slight swales. The other two lineations were not located on the ground during this brief reconnaissance and should be checked further.

- **11. Haystack Complex (Map 48)**

Aerial photography and aerial reconnaissance suggested three roads lead to Haystack Ruin. The northernmost of these is clearly visible as a double swale. The other two segments were not examined in detail, but a large earthwork southeast of the ruin parallels one of the alignments. Further surface inspection is needed in this area.

- **12. Gasco Herradura (Map 49)**

This location was checked on the ground because Gauthier et al. (1981) reported a feature which seemed to fit the description of an herradura. The feature is, in fact, an herradura and is described as LA 14878 in this report (Appendix II). A short segment of prehistoric road associated with the Gasco Herradura is one of the most spectacular examples of construction yet seen on Chacoan Roads. The road is deeply excavated into sandstone bedrock with very large berms (approaching earthwork status) composed almost exclusively of rock rubble. This segment was ground-visible for about 75 meters. Its endpoints are unknown.

- **13. Andrews to Casamero (Maps 50 and 51)**

Cursory surface inspection in this area yielded inconclusive results. None of the imaged segments could be verified as a prehistoric road.

- **14. Muddy Water Complex (Maps 52 and 53)**

Marshall et al. (1979:208) identified north-south trending linear features at Muddy Water which they tentatively interpreted as prehistoric roads. During Phase II the westernmost of these linearities was positively identified as a prehistoric road. The feature is conspicuous as it cuts through the crest of a small ridge at the northern edge of the Muddy Water complex. A second, less conspicuous cut slightly to the east, appears to be a road articulating with LA 10959, a Bonito style great house. The longer road segment makes a slight angle change, then crosses a low-lying area where the berms are very conspicuous and where it is suspected the road was constructed as a causeway for a distance of about 100 meters. Flanking the road at the end of this section is a large earthwork. Although modified by construction of an historic reservoir, this feature was almost certainly first built by the Anasazi. South of the earthwork the road continues for over one kilometer as a broad swale enhanced by erosion.

Two kilometers further south is another 1.4 kilometer visible segment which leads into a canyon at the base of the Dutton Plateau. A dense scatter of ceramics (consisting almost entirely of jar sherds) was found along a ridge crest above the eastern canyon wall. This could imply that the road ascends

onto the Dutton Plateau, as does the South Road above Kin Ya'a. However, no stairs, toe-and-hand-holds, or other evidence of the road was found beyond this ridge.

- **15. Kin Bineola to Bee Burrow (Unmapped except for a small portion on Map 6)**

This road was suspected because of lineations found on aerial photography in the vicinity of Bee Burrow (Map 6). Subsequent inspection of low-sun-angle aerial photography resulted in identification of additional photolineations several kilometers southeast of Kin Bineola. Although the photolineations are convincing in appearance, none of these features could be found or verified as prehistoric constructions during surface inspection.

- **16. Kin Ya'a to Kin Bineola (Not Mapped)**

Initially this road was suspected because of a report of an unrecorded great house along Kim-me-ne-oli Wash between Kin Ya'a and Kin Bineola (Powers personal communication). Subsequently a Navajo informant spoke of a road between Kin Ya'a and Lake Valley. Low-sun-angle aerial photography was obtained over an area up to 10 kilometers south of Kin Bineola in hopes of identifying this feature.

Although prehistoric canals are quite visible, no new prehistoric roads were noted during inspection of these photos. However, much of the projected route between these two sites lies on alluvial floodplains where preservation and visibility are predicted to be very poor.

- **17. Chacra Face Road (Not Mapped)**

This road has been identified primarily through photointerpretation. Phase II aerial reconnaissance showed an especially deep road cut near Fajada Gap and other visible segments indicated this road might extend as far to the southeast as Mesa Cortada. Possible segments in the vicinity of Mesa Cortada were not verified and this interpretation should be considered tentative.

Ground observations were made only in the immediate vicinity of Tse Lichii and Tse La Vie. A swale appeared to articulate with Tse La Vie. However, careful observation indicated that it was narrower than is usual for a prehistoric road, and it was not straight. A short segment was walked and historic artifacts were found along the swale. Subsequently this feature was found to exhibit photocharacteristics of an historic road on the 1930s SCS aerial photography. However, the feature photointerpreted as a prehistoric road lies upslope to the north of this linearity and was not inspected during Phase II.

Additional ground observation will be necessary to verify the Chacra Face Road as a prehistoric feature.

- **18. Mexican Springs Road (Not Mapped)**

This road was identified solely on the basis of photointerpretation (Obenauf 1980). During Phase II, aerial reconnaissance was flown over this road. Topography several kilometers west of Kin Bineola allowed precise location of several photolineations. However, the photolineations were not visible on the day flown. Elsewhere this road appears to be coincidental with the alignment or near alignment of a series of natural aeolian features. Linear dunes and blowouts parallel the road for much of its presumed extent. Thus no clear evidence that this is a prehistoric feature was found. However, its interpretation remains open.

Conclusions and Recommendations

Introduction

The primary objectives of Phase I were to establish the existence of prehistoric roads in the San Juan Basin and surrounding areas, to develop a methodology for their inventory and evaluation, and to suggest a program for long-term management and protection. Phase II was oriented toward discovery and verification of specific Chacoan roads and efforts were concentrated on application rather than development of a methodology. Consequently these studies were more extensive, but less intensive than those of Phase I.

The conclusions derived from Phase II, presented in the following pages, are organized into four sections: 1) archeological conclusions pertaining to the Bonito Phase, 2) methodological conclusions, 3) management-related conclusions and recommendations, and 4) directions for future investigations.

Conclusions Pertaining to the Archeology of the Bonito Phase

1. Roads are a normal aspect of great house architecture. Any Bonito style great house is likely to have associated roads.

2. Chacoan roads are primarily a late-11th to early-12th century phenomenon. Based on articulation with dated sites and on ceramic associations the roads investigated during the BLM road studies do not appear to have been used after approximately A.D. 1150.

3. Road construction was extensively practiced on Chacoan roads in the southern peripheral areas of the San Juan Basin. Construction techniques were essentially similar to those discovered during Phase I investigations.

4. Constructed roads appear to be relatively uniform in overall characteristics throughout the central and southern portions of the Chacoan realm. These characteristics match those described as a result of Phase I investigations. Variability, however, does exist. For example, herraduras are rare or absent on the North Road and on the Ah-shi-sle-pah Road. Cairns were only documented on the Coyote Canyon Road.

5. It is possible that some important Anasazi routes were either never formalized or were formalized using perishable materials which leave no trace today. The herraduras at Rams Pasture and near Standing Rock are the only examples of this site class not associated with visible, constructed roadways. This may imply that non-formalized roads passed by them.

Further evidence that road routes were not always formalized is found south of Kin Ya'a, where the roadway can be traced by sherds in the absence of formal construction; and near Bee Burrow, where evidence of construction along the South Road is lacking, even in areas where it should be well preserved.

6. The significance of herraduras as a site class and road-related feature described in Phase I investigations was further evaluated during Phase II. Examination of 28 herraduras in 19 locations indicate the obvious association of these sites with roads in all but three cases. The locations of herraduras with respect to both topography and the constructed roadbed are quite consistent and predictable.

7. There is no evidence that the presence of the Anasazi roads encouraged either construction of individual residences or establishment of settlements along the road alignment. There is no evidence that purely domiciliary sites articulate with the roads.

8. Expectations derived from Phase I about the nature and distribution of artifacts along the roads were confirmed. Lithic materials are sparse. Sherds are scattered along the roads. When roads pass through areas devoid of other prehistoric activity they can often be followed by the linear distribution of sherds. Overall sherd densities, however, are low along the road and the ceramics, at least, do not reflect intensive or extended use of these features. An absence of hearths, as well as other artifacts suggests it was not customary to camp along the roads and supports the idea their use was non-causal.

9. To date no artifacts which seem to relate to road construction have been found. Sherds along the roads show no indications of abrasion which might be expected if pottery tools were used for excavation. Similarily no lithic artifacts suitable for excavation (such as mauls) and no tools which might be used to make and maintain digging sticks (such as choppers and heavy unifacial tools) were recognized in any unusual frequency.

10. Roads impact older communities in the southern part of the Basin in several locations. In one instance road construction actually resulted in the disturbance of an earlier structural site, demonstrating the non-association of formal road surfaces with these older communities.

11. Earthen architecture is present in a number of areas. These features, termed earthworks in this report, were described as trash mounds by most previous investigations.

It can be demonstrated that these features are definably road-related in most instances, and are not trash mounds in the usual sense. In some situations where the road is not visible in the immediate vicinity of the earthworks, the position and alignment of the road can be predicted by the earthwork orientation.

Conclusions Pertaining to Location and Verification Methodology

1. The reconnaissance methodology for location and verifying Chacoan roads developed in Phase I was shown valid by Phase II investigations. This methodology is based on the uniformity of characteristics, location and significance of road-associated sites such as herraduras, understanding of the geological processes of modification of the roads, and en-

gineered characteristics. There are a number of predictable aspects of the roads including:

a. Association with Bonito style architecture and most intensive formalization in the immediate vicinity of these structures.

b. Herradura locations on major drainage divides offering expansive views along the roads.

c. Places where the roads are not likely to be preserved or visible.

d. Locations where constructed segments are most likely to occur and/or be preserved.

e. Locations where the visibility of the road is likely to be enhanced by natural processes.

2. Aerial reconnaissance proved to be one of the most effective and least expensive initial location and evaluation tools available. The large visible expanse and the moving perspective facilitates reliable assessment of linear features and provides a mechanism for the rapid identification of critical target areas for ground observation. Although identification of prehistoric roads by aerial reconnaissance seems quite reliable, this method should not be considered as verification.

3. The visible life of Chacoan roads is not expended, for the most part. The roads are, however, becoming less and less visible through time, as would be expected. This fact is demonstrated by both photographic and ethnographic evidence. The location of prehistoric roads will probably require increasing utilization of more specialized, sophisticated and expensive techniques of discovery with the passage of time.

4. Low-sun-angle photography is an effective tool for exploration for prehistoric roads as well as for use in conjunction with ground observations during the verification process.

5. This study strengthens the Phase I conclusion that ground observations are an absolute necessity for verification of formalized Chacoan roads. Archeological evidence such as road-associated sites, artifacts and indications of construction are considered essential for the verification of formalized prehistoric roads. Only formalized roads can be verified at the present time.

6. One should be suspicious of photointerpreted alignments in areas of sandy substrate which parallel prevailing wind directions. The image of linear aeolian features in such areas, particularly in black-and-white small scale photographs, may be easily confused with that of prehistoric roads.

7. One should be suspicious of photointerpreted segments which plot as multiple *en eschelon* discontinuous segments. Ground observations and aerial reconnaissance of such features indicate that such imaged segments are usually of a natural origin.

8. It is critical that plotting of both imaged and ground-visible segments be done as accurately as possible. Minor inaccuracies of transfer from the photos or ground to the map base, along with minor permissible inaccuracies inherent to the topographic map, may result in a significant cumulative error. When dealing with such obscure features as roads may be, this error greatly complicates the verification process.

Management-Related Conclusions and Recommendations

The uniformity and predictable characteristics of Chacoan roads and road-related sites demonstrated in Phase I and confirmed in Phase II investigations allow the formulation of a set of management-related conclusions and recommendations for Anasazi roads in the San Juan Basin and surrounding areas.

1. It is possible to define relatively narrow corridors in which roads are possible or probable, based on endpoints such as known road segments and Bonito style structures.

2. These corridors can be rapidly and inexpensively evaluated using a combination of aerial reconnaissance, photointerpretation of conventional and especially low-sun-angle photography, and ground reconnaissance of target areas within the delineated corridors.

3. This methodology provides early input into project planning and minimizes the area of investigation within proposed projects.

4. This methodology is more detailed and reliable than traditional photointerpretation alone, but less so than conventional archeological survey.

5. Conventional archeological survey methods are not recommended except as a follow-up to the reconnaissance procedures because conventional methods are less accurate for the location of roads unless a road corridor has been defined.

Basically, survey procedures are more accurate in the location of roads when oriented along the road rather than across the road.

6. There is a possibility of the existence of non-formalized roads. Although these roads do not appear to be verifiable at the present time, efforts should be directed toward the interdisciplinary examination of such proposed road alignments as a means to develop a verification procedure.

7. Extensive aerial reconnaissance in differing light conditions is recommended for projected alignments in any proposed disturbance area. This reconnaissance will reduce the time required to evaluate projected alignments, consequently reducing cost.

8. Low-sun-angle photography of projected road alignments is recommended. This type photography serves as an inexpensive exploration tool, speeds ground observation procedures, and provides a permanent record of prehistoric roads that may be present. Acquisition of such photography must begin well in advance of any future field investigations of road alignments.

9. Ground observations provide the only means of verification of prehistoric roads. Ultimately, archeological information still provides the only conclusive proof of the existence of a prehistoric road.

10. When a road is verified as prehistoric, it should be considered to be an archeological site and treated accordingly.

Future Directions of Study

The combined results of Phase I and II investigations have increased our knowledge of Chacoan roads. Despite these advances in our understanding, however, much remains to be learned.

The function of the roads in Chacoan society is, of course, one of the most perplexing unresolved issues. Although a variety of functions possibly served by the roads have been postulated including communication and transport of construction materials or exotic trade goods, the fact is that with the exception of ceramics, no durable artifacts were found on the roads to provide an indication of transport of specific items.

One avenue for pursuit of these questions is through carefully designed excavation of Chacoan sites, the presumed endpoints of the transportation system. Another avenue is by a more thorough reconstruction of the road system itself. If the roads were built to facilitate transportation of raw materials and economic goods, then roads should lead to areas where these goods were produced or extracted. It is not yet clear that this is the case.

Thorough reconstruction of the road system is necessary to more accurately assess the extent of the Chacoan system. Current analyses of the road network (c.f. Vivian 1983:3-4 to 3-13) are based on reconstructions which have now been superseded. We believe that additional road verification is needed. In particular, possible links between peripheral great houses (as opposed to links with Chaco Canyon itself) should be explored more thoroughly. It is also appropriate to ask whether or not all roads are necessarily part of an integrated pan-Chacoan road system. There are presently many verified segments for which no potential destination is known.

Although the extent of the known road system was greatly expanded in areas south of Chaco Canyon, knowledge of the actual extent of the Chacoan road network remains fragmentary. Little work was done north of the San Juan River, along the base of the Chuska Mountains, and south of the Red Mesa Valley.

Road construction is another topic which warrants further investigation. It was demonstrated that many portions of the Chacoan roads were constructed, and it can be shown that a degree of engineering was utilized in the layout of the roads. Engineering methodology, however, is incompletely understood at present. The relationship and possible engineering significance of some site types such as "signaling stations" and Windes shrines to roads is unclear. Although it is believed that great houses and roads were placed contemporaneously as an aspect of Bonito Phase activities, the factors that controlled the alignment of the roads and location of the great houses are not understood. In some instances the roads appear to be located partially in consideration of older, presumably pre-formalized road sites. The relationship of these sites to the total road network is incompletely understood.

Dating of the roads is another area of concern. Phase I results (Kincaid, Stein and Levine 1983) and work in Chaco Canyon (Windes 1982a) show that use of the roads can be dated by isolating road-related ceramic scatters and by dating road-related sites through ceramics or chronometric techniques. Emphasis during Phase II was upon identification and verification of road segments. The casual ceramic observations presented in this report should now be supplemented by careful and systematic documentation of pottery found along the roads and by careful consideration of the relationship between the pottery and the prehistoric roads. Additional chronometric dating of road-related sites, especially great houses which are known to be road endpoints, is also very important.

The significance of the roads to present-day Navajo and Pueblo people is another topic which required further investigation. Navajo informants in both the Chaco Canyon area and the Crownpoint area maintain that the roads were trenches or tunnels which allowed the Anasazi and/or early Navajo to conceal themselves from giants (Ye'iitsoh) as they travelled in the San Juan Basin (c.f. York 1982). Navajo informants also relate that as children they were admonished not to play on the old Anasazi roads because they were dangerous (presumably bahadzid). These examples illustrate that a largely untapped body of information does exist among the Navajo. The Zuni and Acoma are also believed to have an interest in and knowledge of the prehistoric roads.

Many of the presently unknown aspects of the Chacoan roads will probably never be known. Future study of the Chacoan phenomenon should, however, consider the roads as a major element of the Chacoan society.

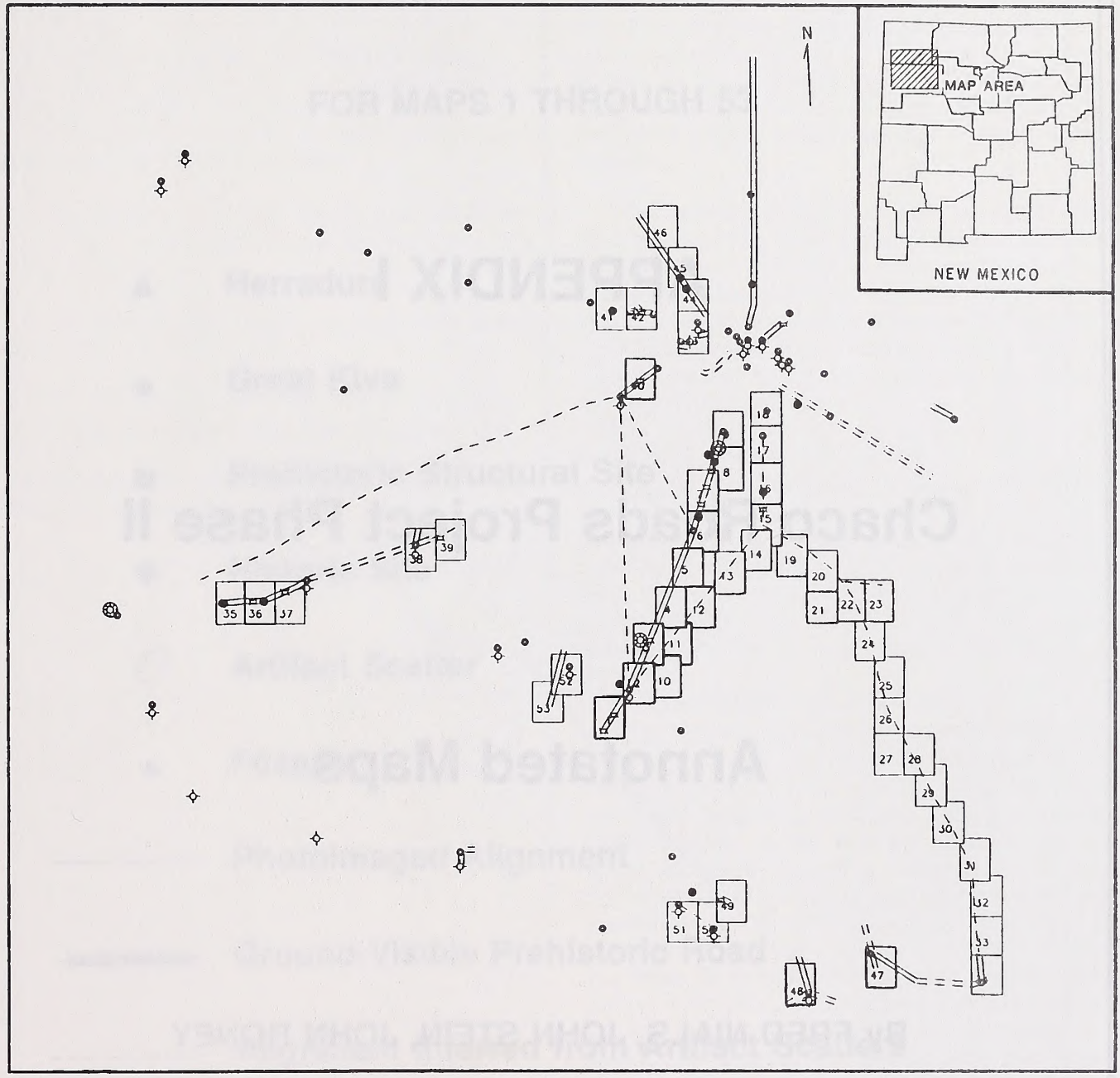


FIGURE 4
INDEX TO APPENDIX I MAPS

APPENDIX I

Chaco Roads Project Phase II

Annotated Maps

By FRED NIALS, JOHN STEIN, JOHN RONEY

LEGEND

FOR MAPS 1 THROUGH 53

Herradura

Great Kiva

Prehistoric Structural Site

Historic Site

Artifact Scatter

Feature

Photoimaged Alignment

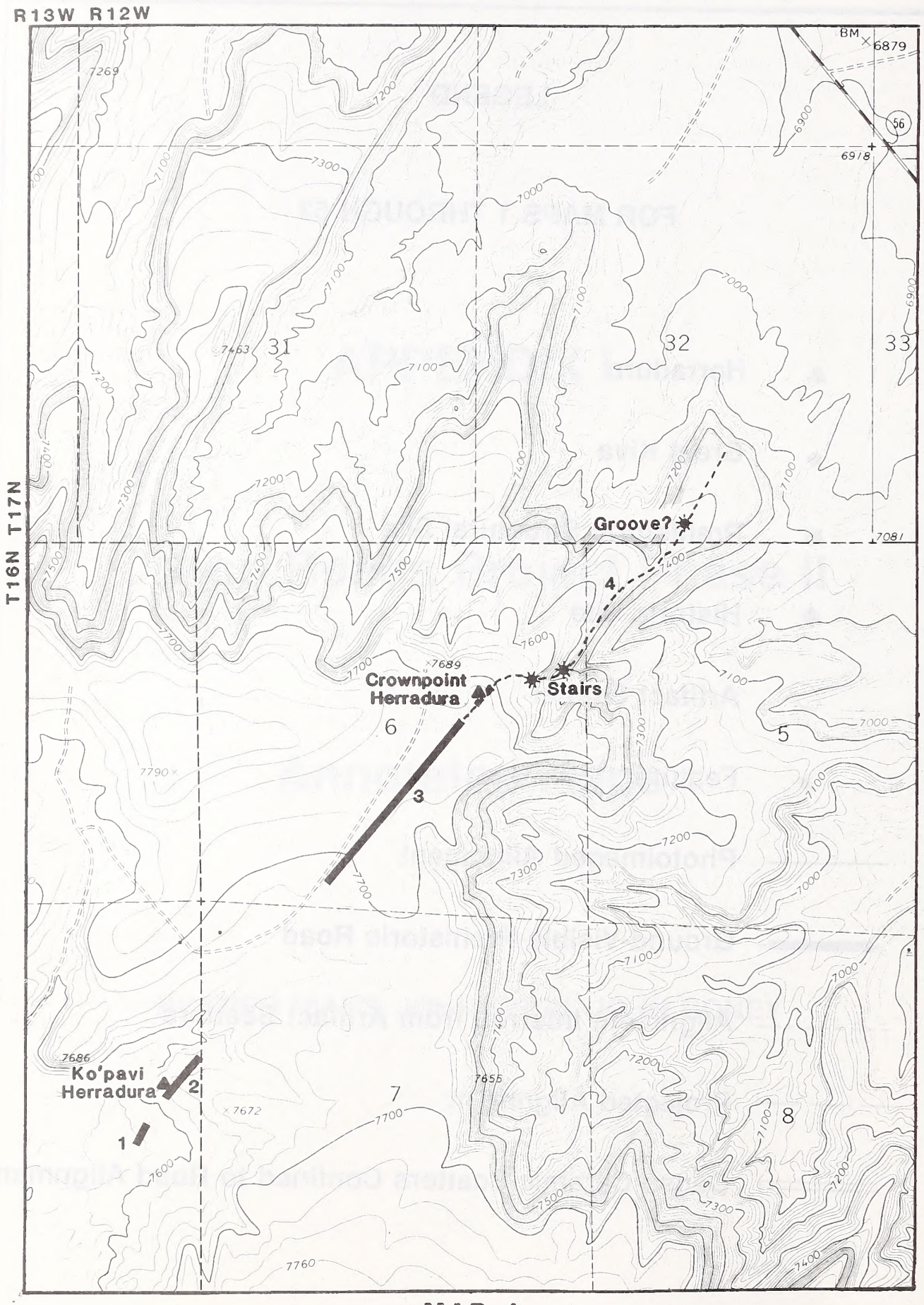
Ground-Visible Prehistoric Road

Alignment Inferred from Artifact Scatters

Projected Alignment

Dense Ceramic Scatters Confined to Road Alignment

SCALE 1:24,000


R13W R12W
T16N T17N
BM 6879
6918
7269
7463
31
32
33
Groove?
7081
4
7689
Crownpoint
Herradura
Stairs
6
5
3
7790
7686
Ko'pavi
Herradura
2
1
7
7655
7672
8
7760

MAP 1

MAP 1

1. Ground observation. Short but very definite visible segment cutting across western end of low rise. Swale is nine to 12 meters wide and perhaps .5 meters deep with an earthen berm on the western side.

2. Ground observation. This segment is intermittently visible as a swale and as a leveled roadbed crossing a side slope. The feature is six meters wide. Several observations suggest prehistoric rather than historic origin for this road segment:

a. the easiest route for an historic road would be either in the canyon bottom below the feature or on the ridge above it;

b. the feature begins on a very steep slope at its southern end;

c. the feature does not deviate from its bearing in the vicinity of small but steep side drainages;

d. the feature aligns with Segment 3 which is of certain prehistoric origin;

e. construction may have involved removal of bedrock; and

f. an herradura is associated with this segment.

3. Ground observation. This one-kilometer-long segment is clearly visible as a swale up to 14 meters wide and over .5 meters deep. Near the middle of the segment is an area of leveling as the road crosses a side slope. Sherds are generally scarce along the alignment, except near the Crownpoint Herradura and on a 100-meter-wide area of slickrock located a short distance south of the herradura. Only one historic artifact, a simple belt buckle, was found. The size and appearance of the swale, its association with the herradura and with sherds, and the presence of large trees growing within the alignment clearly show that the road is prehistoric. This is one of the few road segments which was discovered and followed without the aid of aerial photography.

4. Ground observation. This segment, initially recognized by Windes (1978), lies between the Crownpoint Herradura and the edge of Lobo Mesa, overlooking Kin Ya'a. No berm or border elements occur along this segment, but it can be easily followed by a relatively dense, continuous scatter of sherds for a distance of 1.4 kilometers. A formal stairway, a set of possible toe-and-handholds, and a badly eroded groove in sandstone slickrock which may be of cultural origin were also found along this segment.

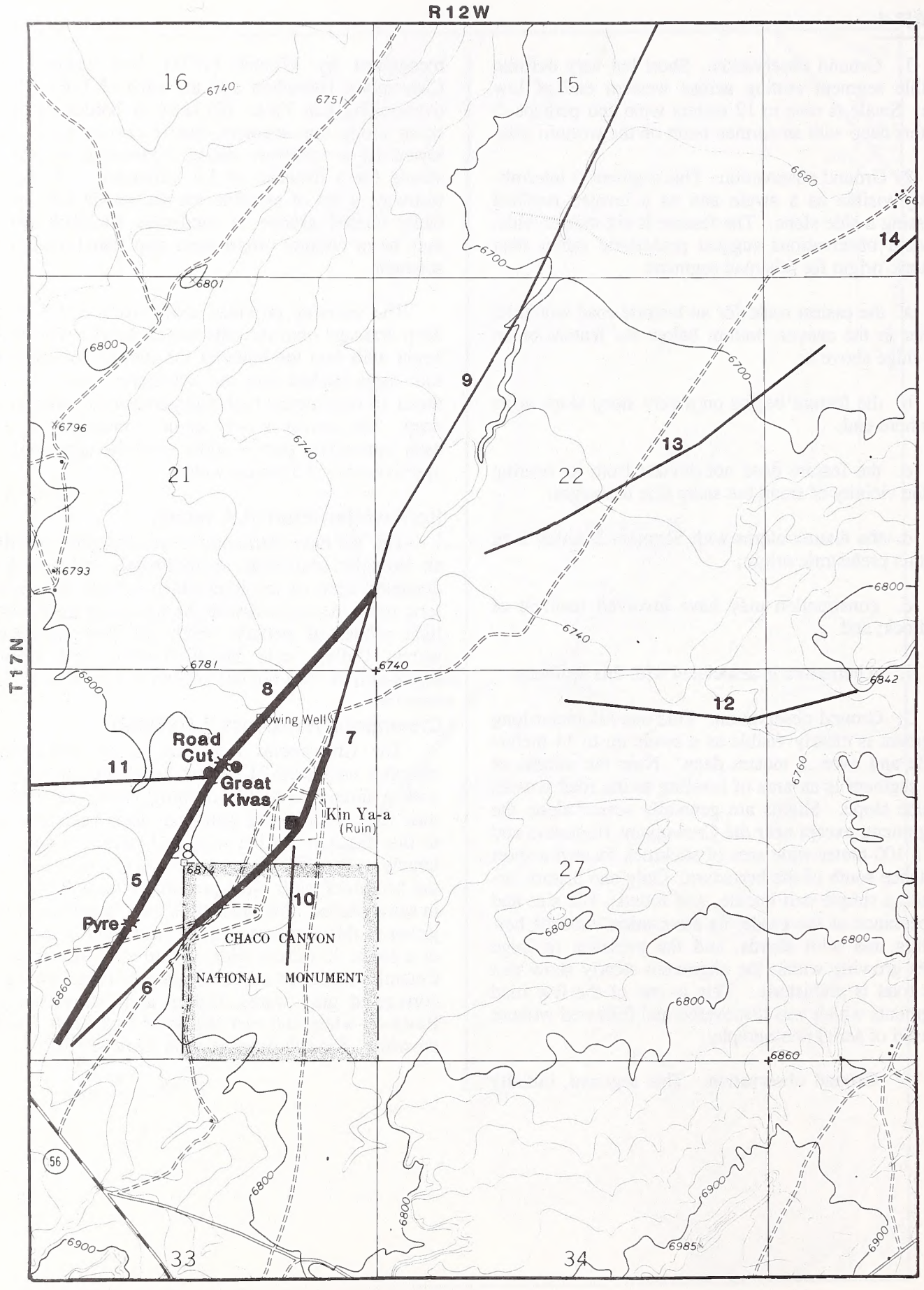
The stairway provides access from a 1.5 meter deep drainage onto the adjacent slickrock. The stairs begin with two toe-holds at the bottom followed by four steps pecked into the sandstone. Each step is about 15 centimeters high and perhaps 30 centimeters deep. The lowest is only about .5 meters wide, but each succeeding step is wider until the uppermost is approximately 1.5 meters wide.

Ko'Pavi Herradura (LA 46008)

The Ko'Pavi Herradura is an enclosure forming an irregular semicircle approximately 14 meters in diameter, open on the edge which borders the prehistoric road. Associated with the herradura itself was a light scatter of pottery which included corrugated wares, Gallup style Black-on-white, and Puerco Black-on-red. See full description in Appendix II.

Crownpoint Herradura (LA 46009)

The Crownpoint Herradura is an oval-shaped masonry enclosure 21 meters by 13 meters in size, with a three-meter-wide opening facing the prehistoric road. Additional walls may have been attached to this structure on the west and south but are now largely concealed by sand. Although now reduced the herradura walls were probably over a meter high in some places. The prehistoric road immediately adjacent to this structure is quite prominent in the form of a swale 20 meters wide and up to .7 meters deep. Ceramics tabulated at this location included plain and corrugated gray wares, Gallup and Escavada style Black-on-white and two sherds of Red Mesa Black-on-white. See full description in Appendix II.


R12W
T17N
16
15
21
22
27
33
34
6740
6751
6680
6700
6801
6800
6796
6793
6781
6740
6842
6760
6814
6860
6985
6900
14
9
13
12
8
7
11
5
6
10
Flowing Well
Road Cut
Great Kivas
Kin Ya-a
(Ruin)
Pyre
CHACO CANYON
NATIONAL MONUMENT
56

MAP 2

MAP 2

5. Clearly visible in aerial reconnaissance and on aerial photography. This prehistoric feature is intermittently ground-visible as a shallow 21-meter-wide swale. As the northern end of the segment approaches the great kivas the road is very pronounced, up to a meter or more in depth, and 23 meters wide. Ceramics are common along the alignment but because of intense prehistoric use in this general area it is impossible to distinguish those which are actually associated with the road.

6. Clearly visible in aerial reconnaissance, on aerial photography, and on the ground. The feature is well preserved from Kin Ya'a south for about 700 meters. In this area it is 15 meters wide and up to .5 meters deep. Elsewhere historic roads have obliterated portions of this segment and the remainder has captured drainages, eroding to a depth of almost two meters. Consequently, no aspects of original construction can be observed. Ceramic association is dense but functional association between the sherds and the roadway is difficult to demonstrate given the high level of prehistoric activity in the general area.

7. Clearly visible on aerial photography and in aerial reconnaissance. Intermittently visible on the ground. At its southern end this segment deviates slightly from the alignment of the South Road in order to pass directly in front of Kin Ya'a. Much of the northern portion of this segment has been obscured by historic activity. Within about 300 meters of Kin Ya'a, however, the road is clearly ground-visible as a shallow parabolic swale enhanced by a lush growth of grasses. In this area the eastern margin of the road is flanked by a series of three linear mounds or massive berms which average 17 meters in width and one meter in relief.

8. Clearly visible on aerial photography, in aerial reconnaissance, and on the ground. At its southern extremity near the great kivas this segment clips the western end of a low sandstone ridge. The entire end of this ridge was removed with spoils piled to the west of the roadbed forming a berm or mound 22 meters long and 13 meters wide with over one meter of relief. The resulting road cut is 1.5 meters deep and 15 meters wide. This portion of Segment 8 has been recorded as the Kin Ya'a West Fork Road Cut (LA 40015) and is described more fully in Appendix II. Immediately north of the cut the prehistoric road has been reused historically and is gullied. Exposed bedrock shows scars from heavy equipment. Beyond the reused portion, the road is more or less continuously visible as a broad shallow swale. About 75 meters north of the section line, between Sections 21 and 28, the road passes through another low ridge. Here the swale is 20 meters in width and .5 meters in depth. Disturbed substrate on the road margins clearly suggests this segment was constructed. Interestingly this portion of the road is poorly visible in aerial photography.

9. Visible in aerial reconnaissance and on aerial photographs. The portion of Segment 9 which is on this map crosses alluvium and is difficult to trace on the ground.

10. This segment is faintly visible in aerial photography but could not be located or followed on the ground. A search for road-related features such as herraduras was conducted along the projected alignment for about two kilometers, also with negative results.

11. In recent aerial photography and on the ground this segment has the appearance of a prehistoric road. However, examination of SCS aerial photography taken in the 1930s clearly shows an historic road in this location. Although the possibility of historic reuse of a prehistoric road cannot be eliminated, present evidence suggests this feature is in fact historic. Further attention should be directed toward this segment though, since it is part of an imaged connection between Kin Ya'a and Muddy Water. Other imaged segments further west along this route were not considered during this project.

12. SCS aerial photography taken in the 1930s clearly shows this to be an historic road. No ground examination was made.

13. Not visible on the ground. The fact it is photovisible in broad areas of alluvium suggests this segment is also historic in origin.

14. See notes for Map 10.

Pyre

This feature is a pile of fire reddened sandstone rocks two meters in diameter and approximately 20 centimeters in relief situated on the western margin of the roadway. The feature is on the highest point of the South Road between Kin Ya'a and the base of the Dutton Plateau. Contemporaneity of the pyre and the road cannot be demonstrated conclusively on the basis of these observations. Also worthy of note is the extraordinarily dense scatter of ceramics on the sandstone ridge immediately west of the prehistoric road.

Kin Ya'a

Kin Ya'a is a multiple-story Bonito style struc-

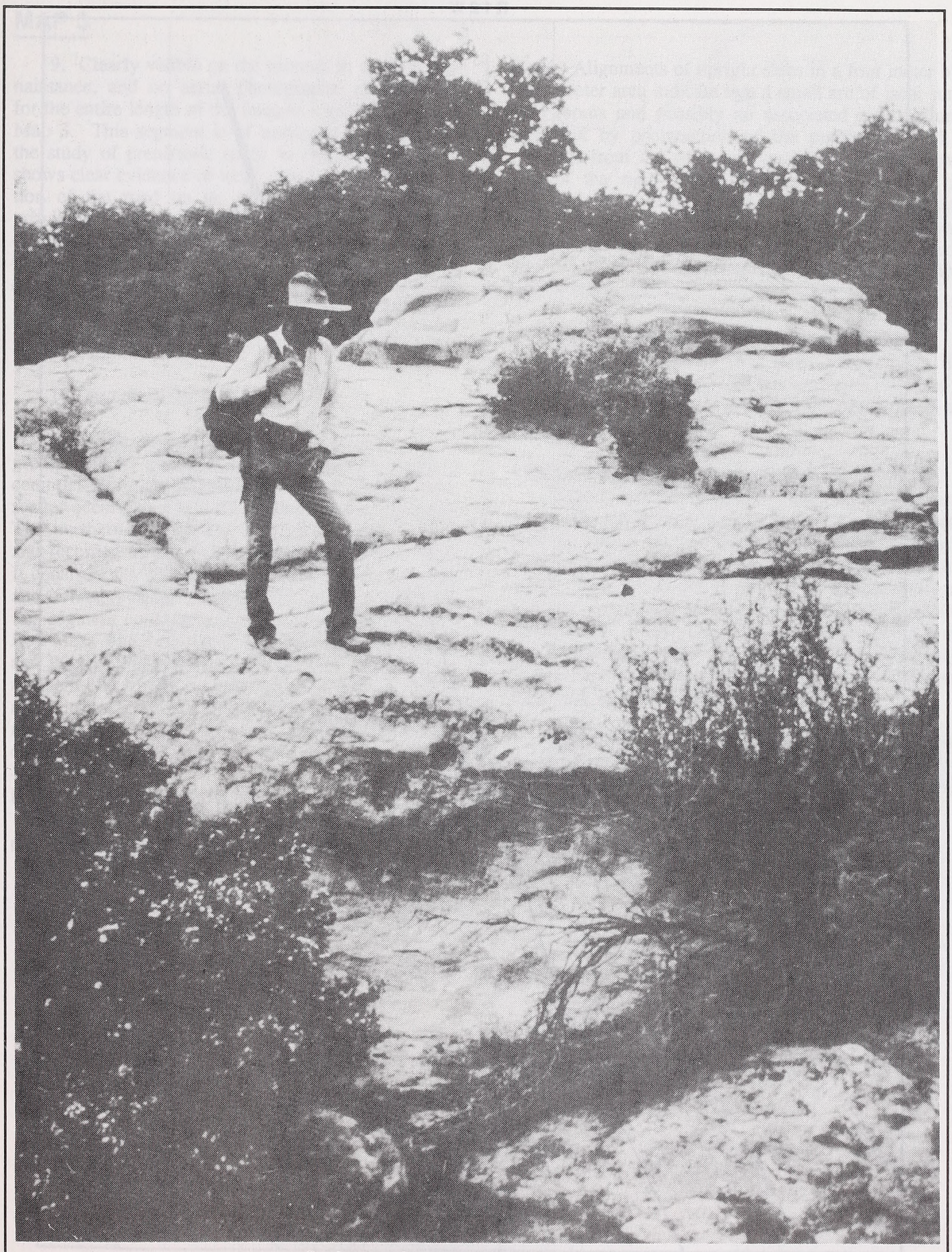
ture with an estimated 26 ground-floor rooms. This ruin includes a four- or five-story tower kiva and is surrounded by an extensive community which includes two great kivas. Tree ring dates from Kin Ya'a cluster at A.D. 1106 (Bannister et al. 1970:25) and ceramic evidence suggests abandonment by about A.D. 1200 or earlier (Powers, Gillespie and Lekson 1983:243).

Since the prehistoric road is intimately connected with the Bonito style structure, it seems likely that at least Segments 6 and 7 were built and used sometime during this interval. A full description of Kin Ya'a was provided by Marshall et al. (1979:201-206) and is not repeated. However, we do draw attention to the two large artificial mounds which form the eastern berm of the road immediately east of Kin Ya'a. These mounds include some trash therefore we hypothesize these features were deliberately constructed and form an aspect of the civic architecture of Kin Ya'a. We also note a broad swale which encircles the Bonito structure. Except for its circular configuration this feature has the appearance of a prehistoric road and we believe that it was also deliberately constructed. Similar features have been observed at other Bonito style buildings, such as Haystack and Manuelito.

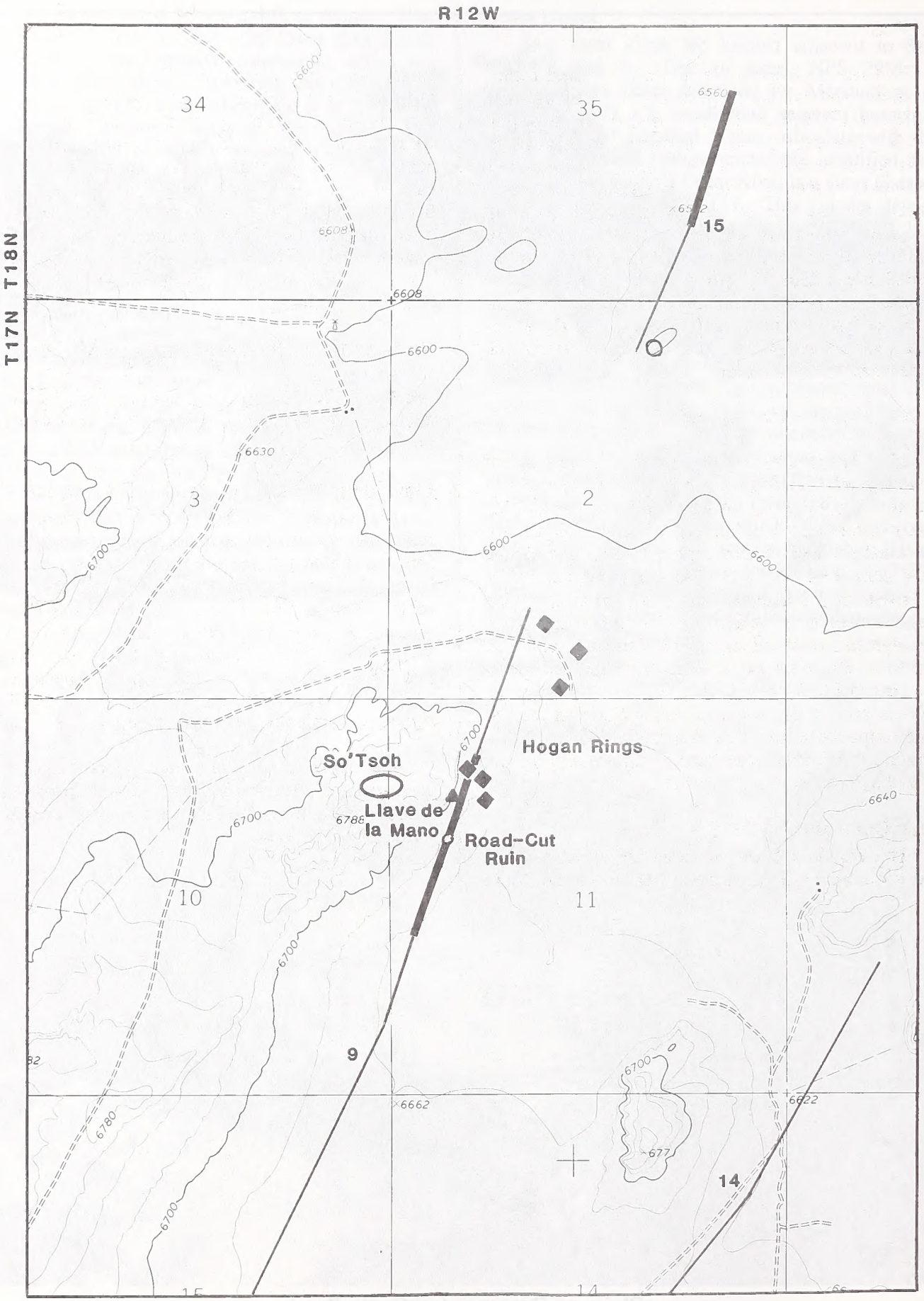
Great Kivas

Two great kivas are located adjacent to Segments 5 and 8. One of these, NPS 29Mc117 (Sa'Kwa), has been described by Marshall et al. (1979:204 307). A small road segment branching from numbered Segment 5 may articulate with this kiva. The second feature tentatively identified as a great kiva, Holsinger's Great Kiva, is a short distance to the southwest of 29Mc117. This circular depression is somewhat larger than 29Mc117, but the kiva is greatly reduced and is difficult to see from the ground perspective. However, it is clearly visible in aerial photography (Powers, Gillespie, and Lekson 1983:203; Hayes 1981:46).

Comments: The area shown in Map 2 includes some of the best examples of prehistoric road construction and engineering found on the periphery of the San Juan Basin. Particular attention is directed to the deep cut near the great kivas and the constructed portion near the northern end of Segment 8, as well as Segments 5, 6, 7, and 8 themselves. Aerial photographs showing much of this area have been published and are readily available (Hayes 1981:46; Powers, Gillespie, and Lekson 1983:203; Obenauf 1983: 407). Because of this and because of its accessibility, this location is an excellent place to observe Chacoan roads.



Stairs on Segment 4 of South Road


R12W
T17N T18N
34
35
3
2
10
11
9
15
14
Hogan Rings
So'Tsoh
Llave de la Mano
Road-Cut Ruin
6788
6700
6600
6630
6640
6662
6622
6780
6608

MAP 3

MAP 3

9. Clearly visible on the ground, in aerial reconnaissance, and on aerial photographs, although not for the entire length of the imaged segment shown on Map 3. This segment is of particular importance in the study of prehistoric roads in the area because it shows clear evidence of local construction, superposition of the road on an earlier structural site, and proximity to a constructed masonry platform. Ceramics vary in abundance on this segment, but in general are relatively sparse. The road becomes obscured to ground visibility as it passes onto alluvium at both the north and south ends of the alignment. Where visible, the road is a nine-meter-wide swale up to one meter deep.

14. See notes for Map 10.

15. The southern half of this segment is not ground-visible, although there is a slight increase in ceramics along the alignment. A small ceramic-lithic scatter occurs on a low hill adjacent to the alignment. The northern half of this segment is ground-visible and recorded as LA 44737 (Fowler and Stein 1983). It consists of a 270-meter-long swale 10 meters wide and .5 meters deep. A total of 17 sherds found along this segment consisted largely of plainware, although Red Mesa Black-on-white, Escavada Black-on-white, and Puerco Black-on-red were present. The extreme northern end of this segment may include an earthen ramp dropping into an area of recent alluvium. Alternatively, this feature may be a miniature alluvial fan created by erosion along the swale.

Road Cut Ruin (LA 38107)

This site is a small Basketmaker III slab structure impacted by a constructed portion of the South Road. Alignments of upright slabs in a four meter by eight meter area indicate that a small arc of jacal surface rooms and possibly an associated pit structure were cut by construction of the prehistoric road. Material from the road excavation was piled to the east of the right-of-way forming a low mound or berm 22 meters north-south by 11 meters east-west. This mound is clearly composed of disturbed materials including possible natural substrate which was overturned in the excavation. See full description in Appendix II.

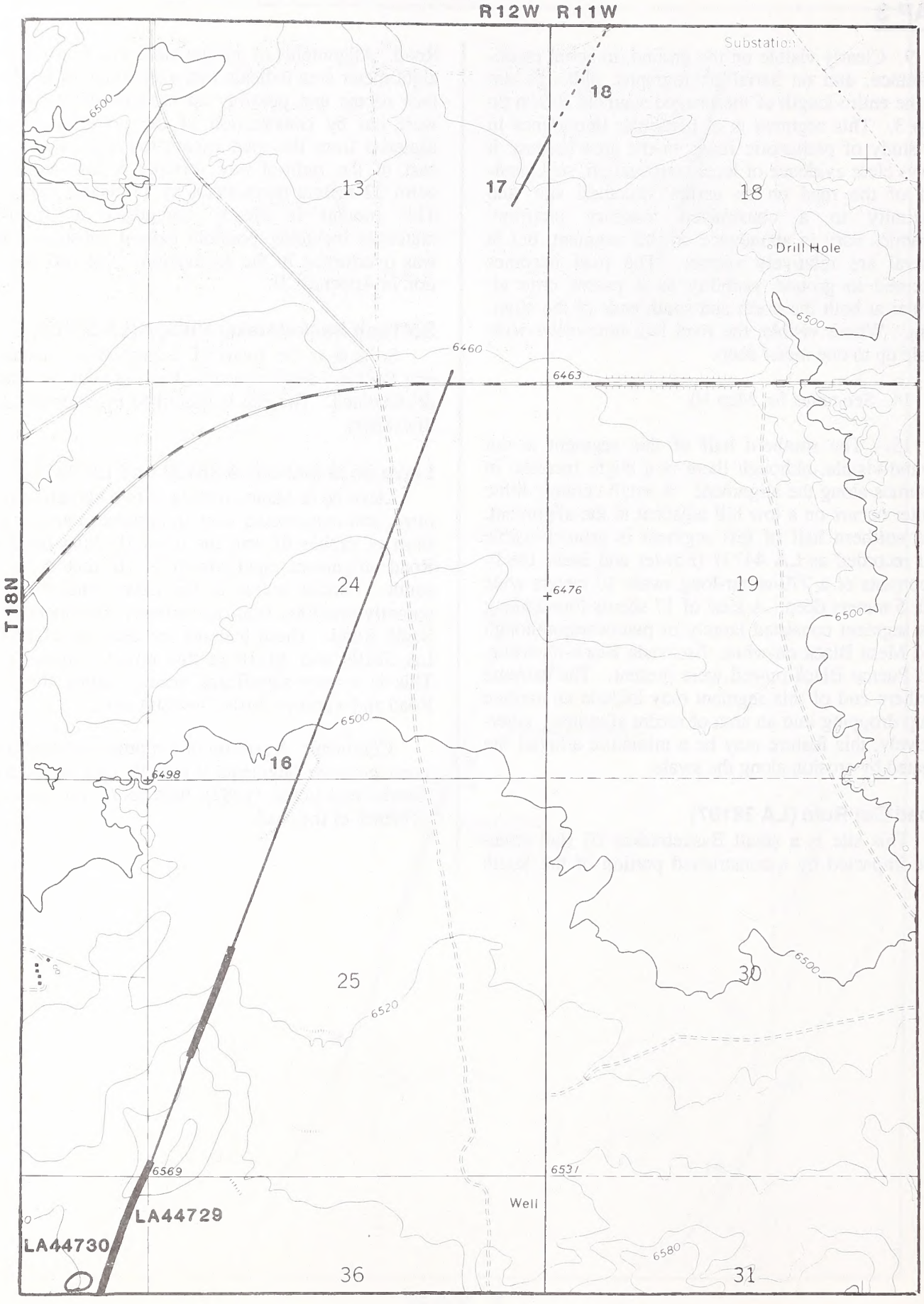
So'Tsoh Basketmaker Village (LA 38108)

So'tsoh is the focus of a large Basketmaker III and Pueblo I settlement that has not been previously documented. The site is described in Appendix II of this report.

Llave de la Mano (LA 38109 and LA 38110)

Llave de la Mano consists of two herradura structures, one constructed atop an apparent ramp or platform of rubble fill and the other flanking the South Road alignment approximately 10 meters to the south. Formal access to the Llave platform is apparently provided from the primary alignment of the South Road. These features are described further as LA 38109 and 38110 in this report (Appendix II). This is a very significant location along the South Road and warrants further investigation.

Comment: A portion of the projected road alignment between Segments 9 and 15 was inspected by Condie and Loose (1982), who found no conclusive evidence of the road.


R12W R11W
T18N
Substation
Drill Hole
Well
LA44729
LA44730
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18
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16
25
30
36
31
6500
6460
6463
6476
6498
6520
6569
6531
6580

MAP 4

MAP 4

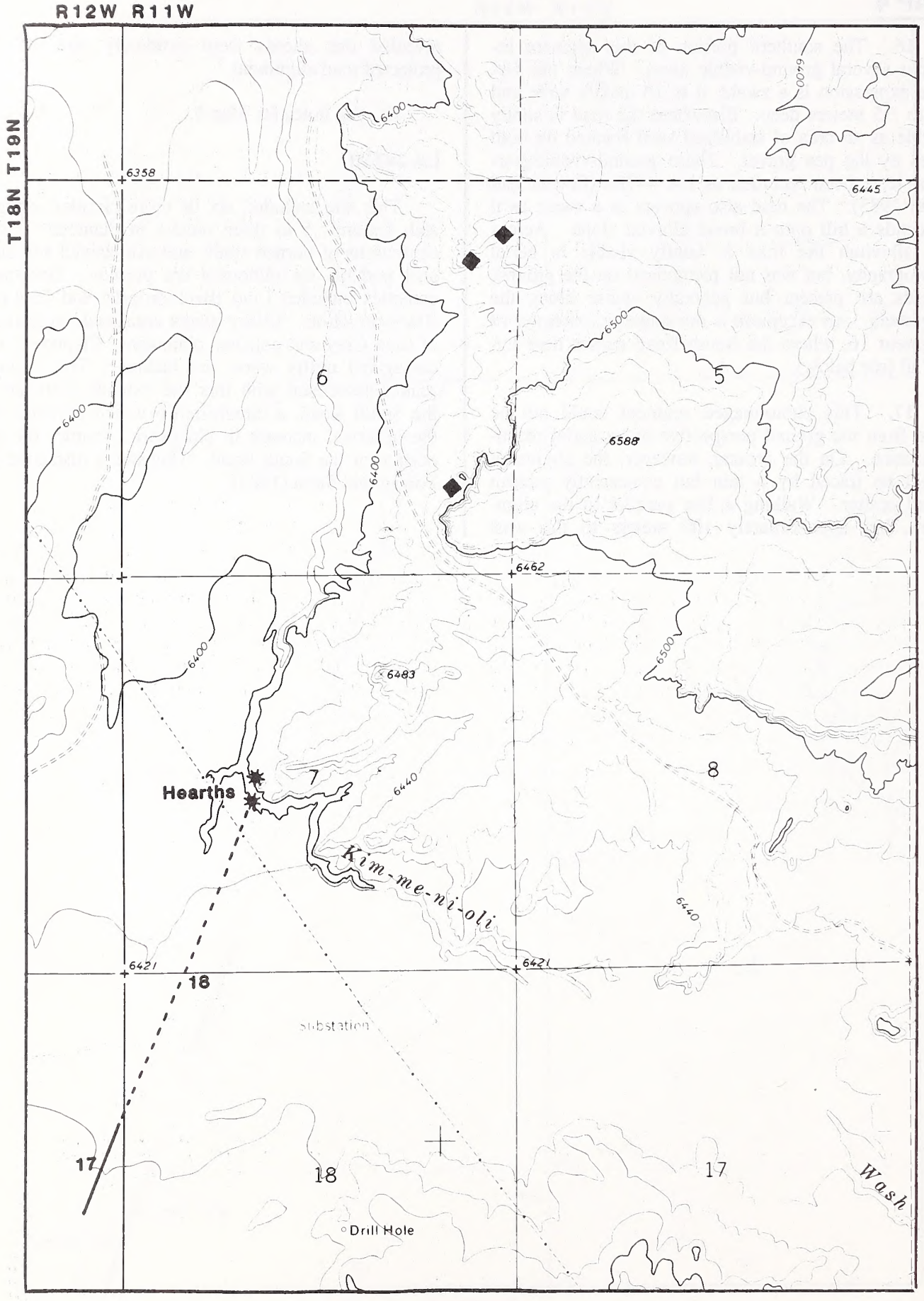
16. The southern portion of this segment includes several ground-visible areas. Where the surface expression is a swale, it is 10 meters wide and up to .35 meters deep. Elsewhere the road is subtly visible as an area of stabilized sand flanked on both sides by lag pea gravel. These ground-visible portions have been recorded as LA 44729 (Fowler and Stein 1983). The road also appears as a swale as it descends a hill onto a broad alluvial slope. Across the alluvium the road is faintly visible in aerial photography, but was not recognized on the ground. Sherds are present but generally sparse along the alignment. An exception is the southern extremity of Segment 16, where the South Road passes near LA 44730 (see below).

17. This photoimaged segment could not be seen from the ground perspective or by aerial reconnaissance. On the ground, however, the alignment could be traced by a thin but consistently present sherd scatter. Walking a line parallel to the alignment, but approximately 100 meters to the west revealed that sherds were extremely rare off the projected road alignment.

18. See notes for Map 5.

LA 44730

This site included six or more circular, upright slab features .5 to three meters in diameter. Concentrations of burned spalls and ash-stained soil suggest perhaps six pithouses are present. Decorated ceramics included Lino Black-on-gray and La Plata Black-on-white. Utility wares consisted exclusively of Lino Gray and polished plainware. Clapboard and corrugated utility wares are lacking. The ceramic scatter associated with this site extends eastward to the South Road, a circumstance which accounts for the observed increase in plainware ceramics on this portion of the South Road. This site is discussed by Fowler and Stein (1983).


R12W R11W
T18N T19N
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6400
6500
6588
6483
6440
6
5
7
8
18
17
Hearths
Kim-me-ni-oli
substation
Drill Hole
Wash

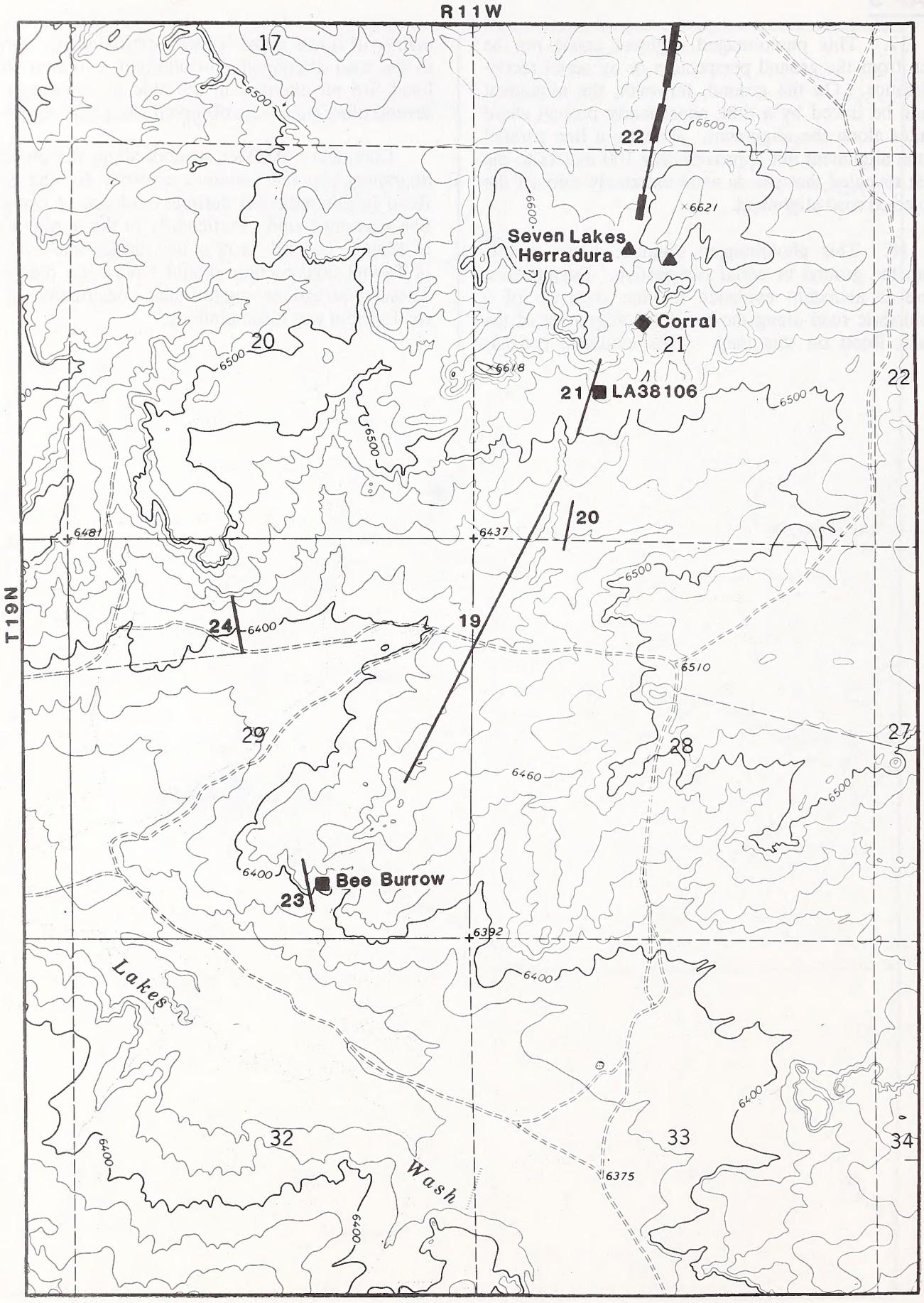
MAP 5

MAP 5

17. This photoimaged segment could not be seen from the ground perspective or by aerial reconnaissance. On the ground, however, the alignment could be traced by a thin, consistently present sherd scatter along the alignment. Walking a line parallel to the alignment but approximately 100 meters to the west revealed that sherds were extremely rare off the projected road alignment.

18. This photoimaged segment is not visible from the ground or aerial perspective. Despite this, there is abundant evidence for the presence of a prehistoric road along the projected alignment of the South Road on this map. This evidence consists mainly of linear sherd scatters approximately parallel to the road alignment. In addition, a buried stone-lined fire pit exposed in the side of an arroyo and several other sites were observed along this segment.

Comment: Artifact scatters along the projected alignment provide tentative evidence for the South Road in this area, but definite evidence of construction was not found. Particularly in the northern area of Map 5, bedrock is near the surface and evidence of formal construction should have been preserved. These observations suggest that construction of the road system was discontinuous.


R11W
T19N
17
16
22
6600
6621
Seven Lakes
Herradura
Corral
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20
6500
6618
21
LA38106
22
6481
6437
20
19
24
6400
6510
29
28
27
6460
6500
6400
Bee Burrow
23
6392
Lakes
6400
32
33
34
Wash
6375
6400

MAP 6

MAP 6

19. This segment is visible in aerial photography but no clear evidence of construction was seen on the ground. The alignment in the southern half of this segment could easily be followed by the distribution of sherds. In the northern half of Segment 19 sediments are mainly alluvial in character and no substantive indication of the former presence of the road could be found on the ground. Viewed from the proper perspective, an apparent lineation could be seen, but was too obscure for words and may have been a product of our imagination (rorschached).

20. This segment could not be identified from either the ground or aerial perspective.

21. This segment was not conclusively visible from the ground perspective, but the projected alignment places it immediately adjacent to a small roomblock (LA 38106). Only a very limited number of sherds could be found and none of these could be demonstrated to be in their present position because of the road rather than the roomblock. An historic corral is located as indicated on the map.

22. Locally visible from the ground perspective, visible by aerial reconnaissance and clearly visible on aerial photographs. There is evidence of construction of the road approximately 50 meters north of Seven Lakes Herradura and in a second area approximately 150 meters further north. The latter location was originally recorded by the School of American Research (Beal 1976). The evidence is in the form of low rubble and earthen berms along one or both sides of the alignment, a shallow swale, and very localized drainage modification. Apparent width varies between 6.5 meters and 8.5 meters. Sherds are present as a poorly defined linear scatter along the southern two-thirds of this segment. Curiously, no evidence of construction could be detected in the immediate vicinity of the herradura. This may be the result of erosion in the area, or the lack of stones in the substrate, which is shale at the herradura.

23. This segment could not be identified in the field. There were numerous sherds in the general area, but these could be attributed to the simple proximity of Bee Burrow.

24. This segment could not be seen from the ground perspective, nor from aerial reconnaissance.

Bee Burrow

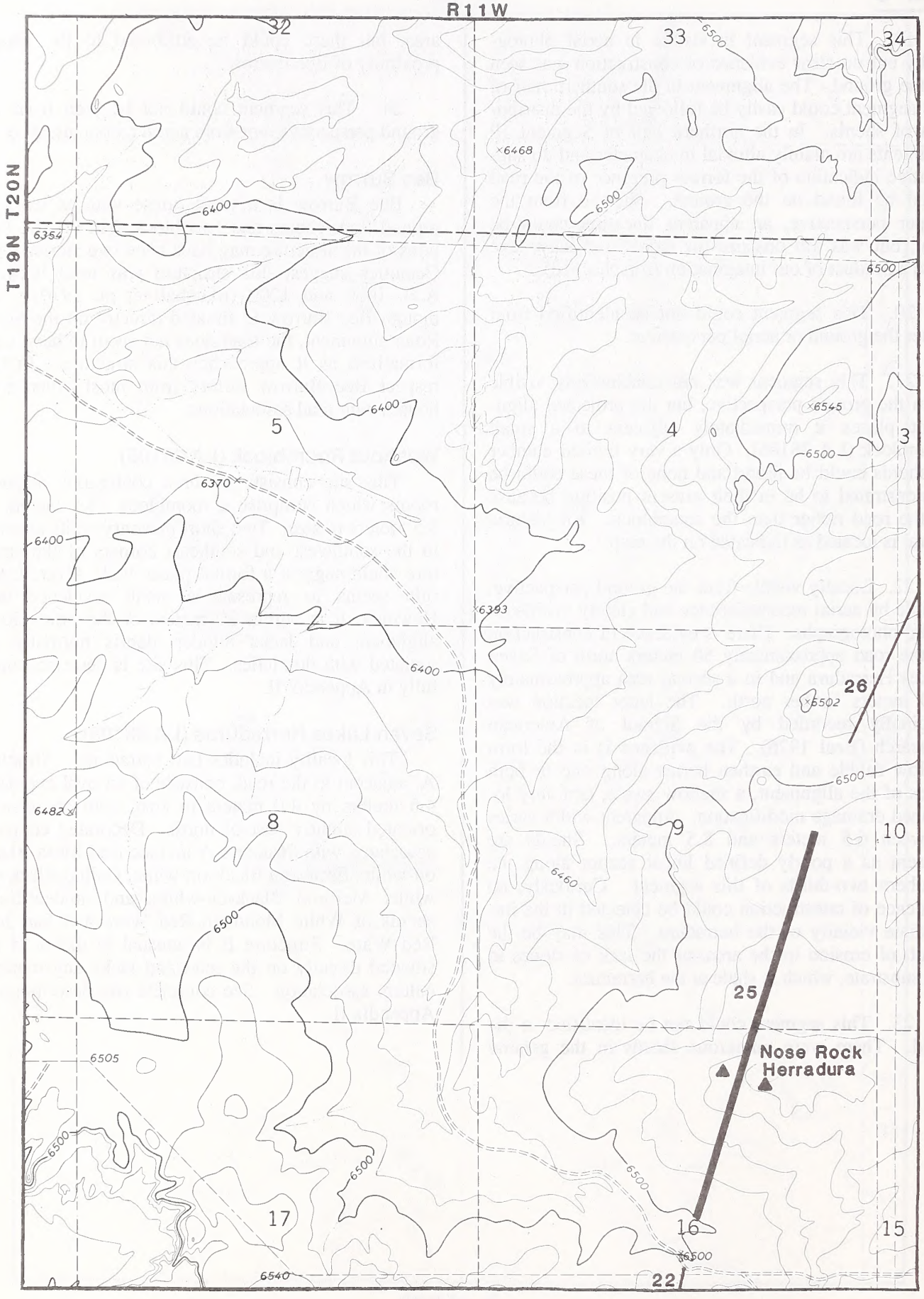
Bee Burrow is a great house with at least 11 ground-floor rooms and two blocked-in kivas. Portions of the structure may have been two stories high. Ceramics suggest this structure was used between A.D. 1050 and 1200 (Marshall et al. 1979). Although Bee Burrow is situated directly on the South Road alignment, the road does not seem to have been formalized as it approaches this structure. In this respect Bee Burrow differs from most other great houses with road associations.

Washout Roomblock (LA 38106)

This site consists of three contiguous masonry rooms which comprise a roomblock 13.5 meters by 3.5 meters in size. Two short masonry walls attached to the southwest and southeast corners of the structure could suggest a formal plaza wall. Overall, this ruin seems to represent a small residence unit. However, it is within 20 meters of the South Road alignment and lacks midden debris normally associated with domiciles. This site is described more fully in Appendix II.

Seven Lakes Herraduras (LA 38105)

This locality includes two herraduras. Structure A, adjacent to the road, consists of an oval enclosure 4.5 meters by 4.0 meters in size, with an opening oriented slightly east of north. Decorated ceramics associated with Structure A include Red Mesa Black-on-white, Escavada Black-on-white, Gallup Black-on-white, McElmo Black-on-white, and unidentifiable sherds of White Mountain Red Ware and San Juan Red Ware. Structure B is unusual in that it is not situated directly on the road and lacks any material culture association. See complete site description in Appendix II.


R11W
T19N T20N
32
33
34
5
4
3
8
9
10
17
16
15
22
25
26
6354
6468
6545
6370
6393
6502
6482
6505
6540
6400
6500
6460
Nose Rock
Herradura

MAP 7

MAP 7

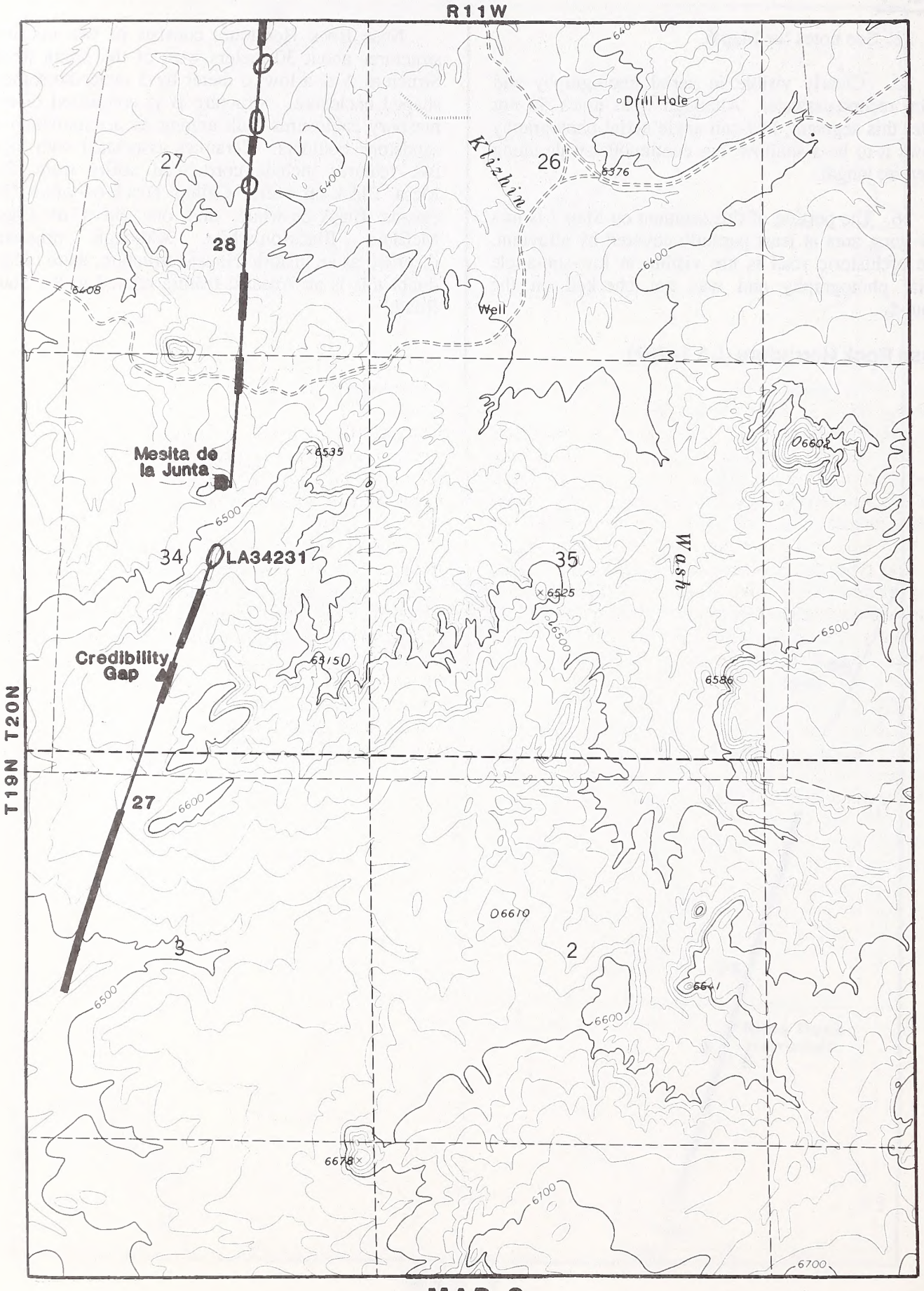
22. See notes for Map 6.

25. Clearly visible in aerial photography and aerial reconnaissance. Although field notes do not cover this segment, low-sun-angle aerial photography shows it to be a shallow, but continuous swale along its entire length.

26. The portion of this segment on Map 7 is in a low-lying area at least partially covered by alluvium. The prehistoric road is not visible in low-sun-angle aerial photography and was not checked on the ground.

Nose Rock Herradura (LA 14787)

Nose Rock Herradura consists of two masonry structures about 30 meters west of the South Road. Structure A is a low, 6 meter by 5 meter horseshoe-shaped enclosure. Structure B is comprised of two masonry enclosures built among an accumulation of sandstone boulders. Ceramics associated with these two features include corrugated utility ware, Red Mesa Black-on-white, Gallup Black-on-white, Escavada Black-on-white, and one sherd of Chaco McElmo Black-on-white. Although originally recorded as an historic Navajo structure, there is little doubt this is an Anasazi feature related to the South Road.


R11W
T19N T20N
Drill Hole
Kiz hin
Well
Wash
Mesita de la Junta
LA34231
Credibility Gap
27
28
26
34
35
2
3
6400
6408
6376
6535
6500
6525
6150
6586
6600
6610
6641
6678
6700

MAP 8

MAP 8

Note: This area was studied intensively during Phase I of the Roads Project.

27. This segment includes roughly two kilometers of the South Road alignment south of La Mesita de la Junta. The alignment as it passes through Credibility Gap is clearly ground-visible as a swale and is enhanced by vegetation differential and artifact association.

This segment of the south road was intensively examined during Phase I of the Chaco Roads Project and is described by Stein (1983:8,12-13). Site locations shown on Map 8 are based on Stein (1983:Figure 10).

Credibility Gap Herradura (LA 34233)

The Credibility Gap Herradura is a horseshoe-shaped masonry structure seven meters in interior dimension opening to the east onto a formal section of the South Road, known as the Mile Long Swale. This structure was originally documented by the Remote Sensing Project crew in 1973 and probably was the type location for "Round Roadside Attractions of the 'Shrine-like' variety." (See Kincaid, Stein and Levine 1983:9,22). A description of the Credibility Gap Herradura is provided in Stein and Levine (1983:C-19-20).

LA 34231

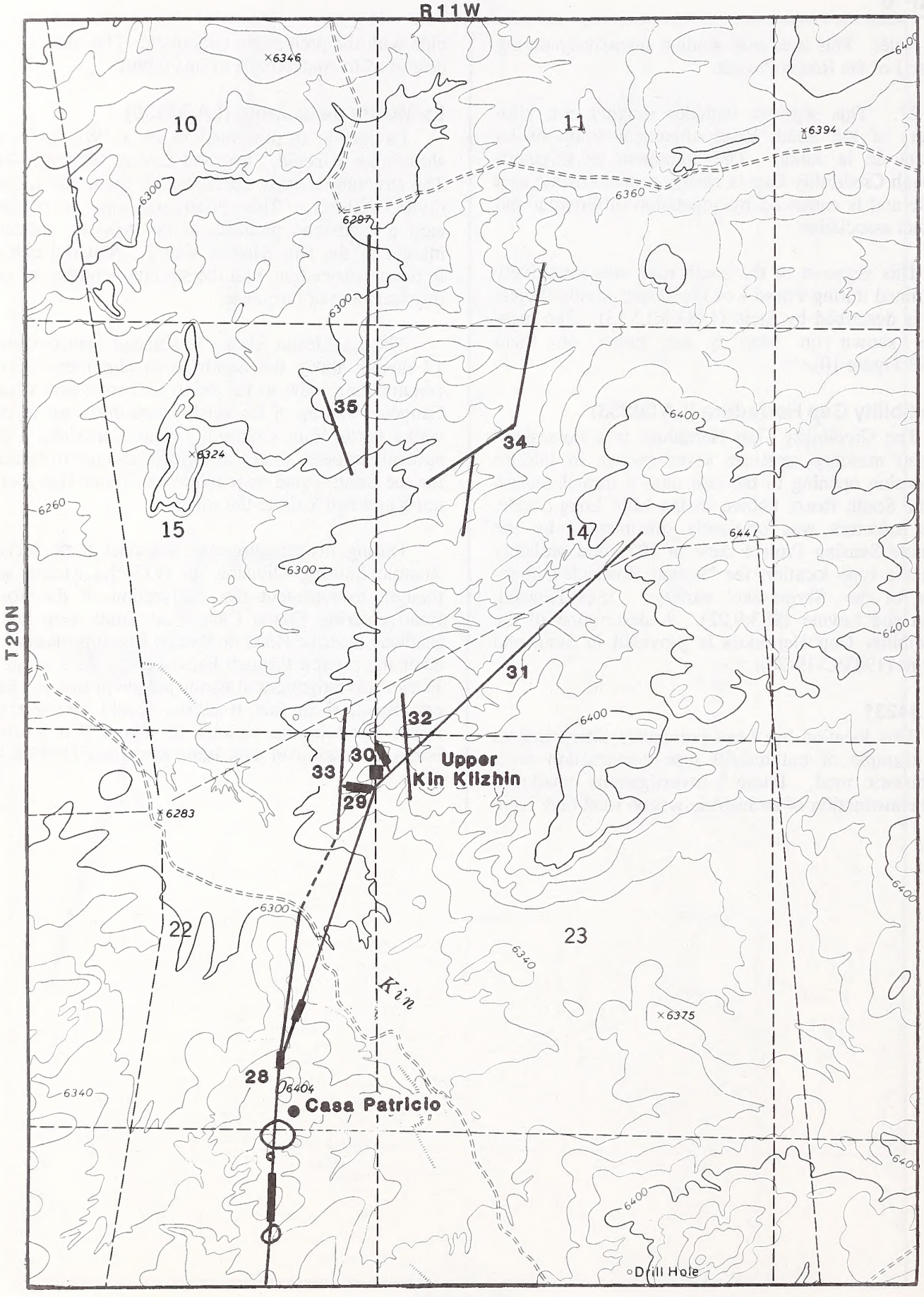
This location has been previously interpreted as an example of cut-and-fill type construction on a prehistoric road. Phase I investigations concluded that construction of an historic wagon road may coincide with the prehistoric alignment. This site is fully described in Appendix II of this report.

La Mesita de la Junta (LA 34230)

La Mesita is presumed to be a "Windes" type shrine (see Kincaid, Stein and Levine 1983:9,20-21). The structure is fully described by Stein and Levine (1983:C-60-62). This small enclosure is perched atop a sandstone pinnacle at the extreme southern margin of the Kin Klizhin Valley. Material culture in direct association with the structure consists of one tiny fragment of turquoise.

The La Mesita Shrine is situated approximately 12 meters above the South Road alignment with a commanding view to the north and west into Chaco Canyon. The tip of La Mesita rises into view as one walks north from Credibility Gap Herradura. The structure appears to signal a major change in bearing for the South Road as it aligns on South Gap to the north and Kin Ya'a to the south.

During investigations by National Park Service Remote Sensing Division in 1973, La Mesita was thought to represent the intersection of the South Road entering Chaco Canyon at South Gap and a roadway (Latrine Road or Rincon Road) postulated to enter the canyon through Fajada Gap. As a result of Phase I investigations it is our judgment that the Rincon Road, if in fact it exists, would intersect the South Road in the vicinity of Upper Kin Klizhin. For a discussion of this issue see Stein (1983:8,10-15).


R11W
T20N
10
11
15
14
22
23
35
34
31
32
30
33
29
28
Upper
Kin Kilzhin
Kin
Casa Patricio
Drill Hole
×6346
×6394
×6324
×6283
×6375
6297
6404
6300
6360
6400
6260
6441
6340

MAP 9

Map 9

Note: Portions of the road system shown on Map 9 were studied intensively during Phase I of the Roads Project.

28. From south to north, this segment originates at the base of La Mesita de la Junta and is alternately visible as a swale or ceramic scatter for roughly three kilometers where it drops onto the floodplain of the Kin Klizhin Wash. In this area the South Road alignment passes through portions of an earlier Anasazi community presumably focused on the great kiva Casa Patricio, long abandoned by the time the South Road was formalized. The density of cultural material in this area complicates ground documentation of the roadway. At a point 300 meters north of Casa Patricio, Segment 28 bifurcates with the eastern branch angling towards Upper Kin Klizhin. This bifurcation is clearly visible in the available imagery and could be seen clearly in aerial reconnaissance. The locations shown on Maps 8 and 9 are based on Stein (1983:Figures 8-10). The reader should note that the alignments of the South Road and Upper Kin Klizhin spur north of Casa Patricio were adjusted to reflect aerial reconnaissance information obtained after the Phase I survey (see Stein 1983: Figure 8-8). Because of the complexity of the archeological record and the low ground visibility of the road alignments in this area, more thorough comparisons of ground and aerial information are recommended.

29. This segment is illustrated and described briefly by Stein and Levine (1983:C-32 and Figure C-11). The swale is recorded as six meters in width and is visible for only a short distance on the ridgecrest northwest of Upper Kin Klizhin. The swale approaches the Upper Kin Klizhin structure at a bearing of N275°. This segment was not located during aerial reconnaissance flights, suggesting more intensive ground documentation should be undertaken here.

30. This swale is illustrated by Stein and Levine (1983:Figure C-11) as a spur connecting Upper Kin Klizhin with the South Road. This spur is clearly ground-visible as a swale six meters in width and 0.25 meters deep. The swale is visible for 50 meters as it cuts the crest of the ridge northwest of Upper Kin Klizhin at a bearing of N348°.

31. Not considered in this project.

32. Not considered in this project.

33. Not considered in this project.

34. Not considered in this project.

35. Not considered in this project.

Casa Patricio (LA 34208)

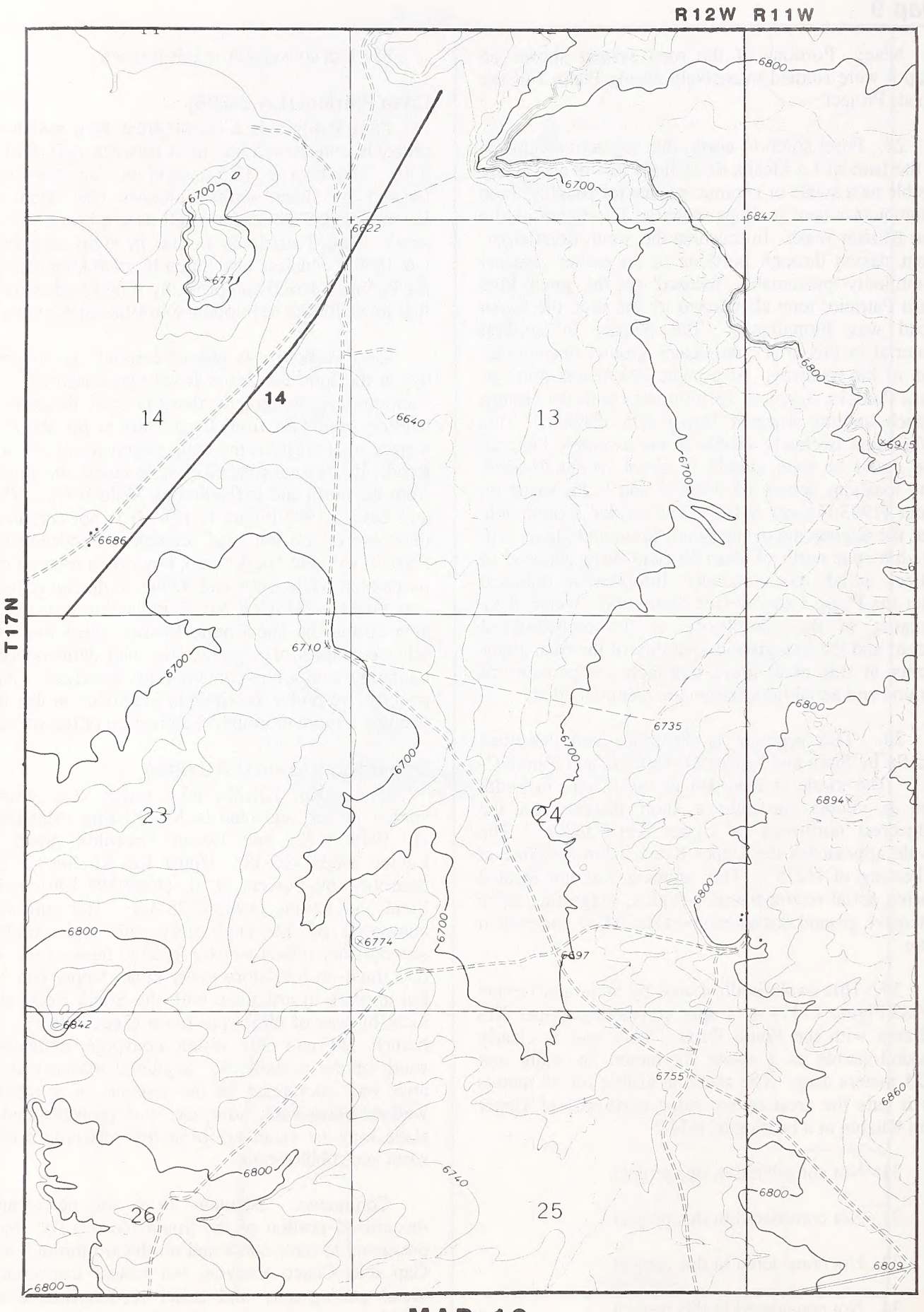
Casa Patricio is a small great kiva which was probably constructed and used between A.D. 850 and 950. The kiva is 12.5 meters in diameter and is flanked by three surface alcoves (see Stein and Levine 1983:C-32-36 for a full description of the site area). Casa Patricio is similar in many respects to LA 18707, which is also an early great kiva dating to the Pueblo I period and probably functioned as the initial focus for the developing Kin Bineola community.

Casa Patricio was almost certainly no longer in use at the time the South Road was constructed. In some aerial photography there is faint lineation extending southwest from Casa Patricio for about 100 meters where it joins the main alignment of the South Road. Likewise a road-like swale enters the site area from the north and is flanked by Midden No. 2 (Stein and Levine 1983:Figure C-12). It is not certain that these are or are not road segments connecting Casa Patricio with the South Road, however a trace of carbon-painted whitewares and White Mountain redwares was noted in Midden No. 2 indicating reuse of the area during the late Bonito Phase. We know of no other examples of a prehistoric road deliberately articulating with a non-contemporary structure. Consequently, we prefer to withhold judgment on this issue pending a more thorough examination of the site area.

Upper Kin Klizhin (LA 34245)

Upper Kin Klizhin is a tower kiva structure similar in size and plan to Kin Klizhin (Marshall et al. 1979:69-72) and Lower Greenlee (Stein and Levine 1983:C-36-38). Upper Kin Klizhin has been described by Powers et al. (1983:193-196) and by Stein and Levine (1983:C-28-32). The building is composed of 12 single-story and eight probable second-story rooms which served to buttress the mass of a three- to four-story tower kiva. Upper Kin Klizhin appears to articulate with the South Road alignment by way of three spur roads (Segments 28 – east branch, 29 and 30) which converge immediately south of the roomblock. Scattered masonry in this area was interpreted as the remains of a retaining wall or plaza wall; however, it is probable that the slabs may be remnants of a low masonry curb or earth and rubble berm.

Comments: Segment 28 is the northernmost recognized portion of the South Road. The road is presumed to have continued northward through South Gap into Chaco Canyon, but casual inspection of aerial photography and aerial reconnaissance have failed to produce additional evidence of the road.


R12W R11W
T17N
14
13
23
24
26
25
6800
6700
6847
6622
6771
6640
6686
6710
6735
6894
6774
6697
6842
6755
6860
6740
6809
6915

MAP 10

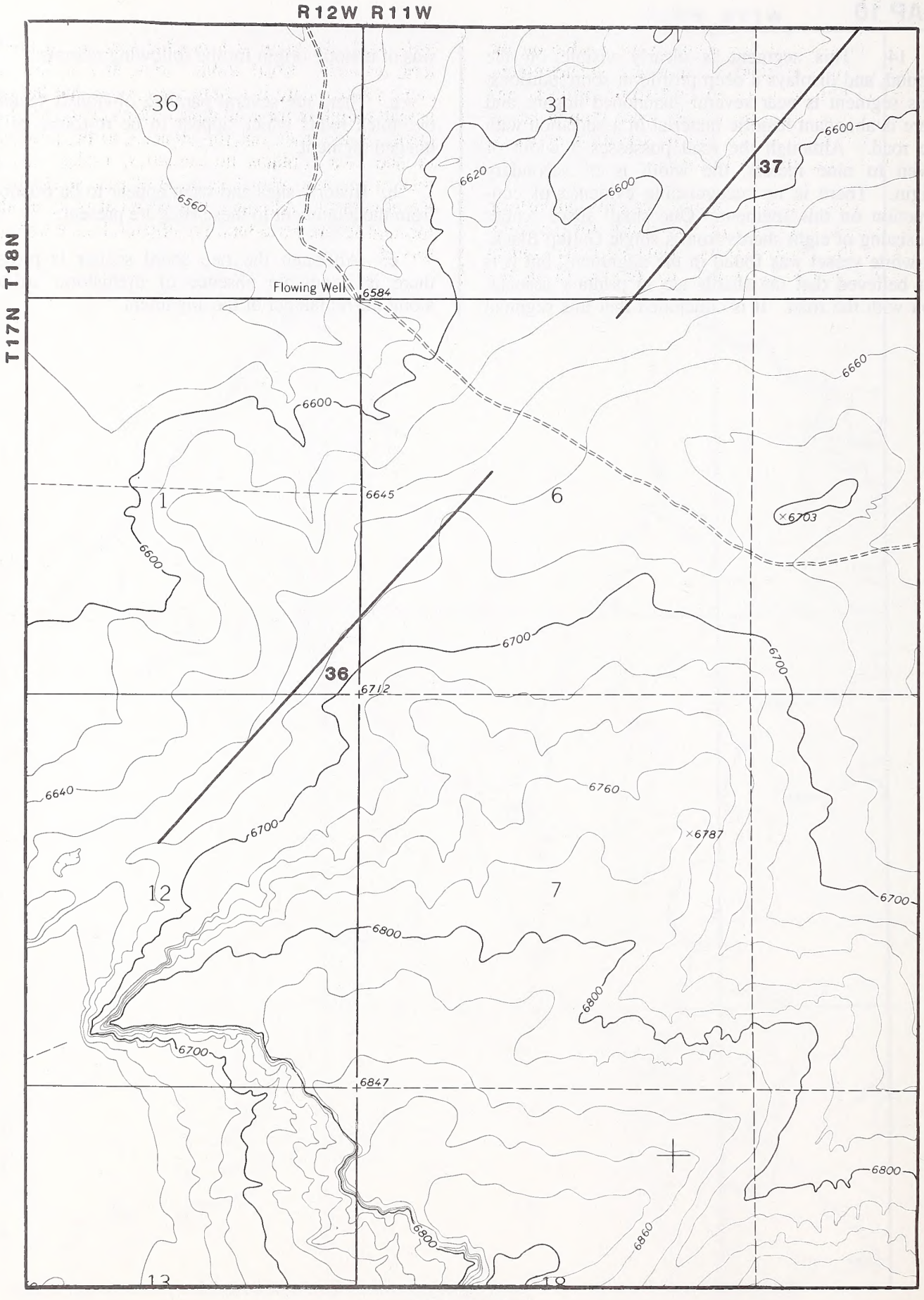
MAP 10

14. This segment is clearly visible on the ground, and displays a deep profile in some portions. This segment is near several abandoned hogans and there is abundant historic material in association with the road. Although the road possesses a width of seven to nine meters, the width is of secondary origin. There is no recognizable evidence of construction on this segment. One small sherd scatter consisting of eight sherds from a single Gallup Black-on-white vessel was found in the alignment, but it is not believed that the sherds are in primary association with the road. It is concluded that this segment was of historic origin for the following reasons:

a. There are several parallel, obviously historic, two-track roads which appear to be re-routes of the imaged segment.

b. Historic sites and what appear to be offshoots from the alignment to these sites are present.

c. Although the one sherd scatter is present, there is a notable absence of prehistoric artifacts along the remainder of the alignment.

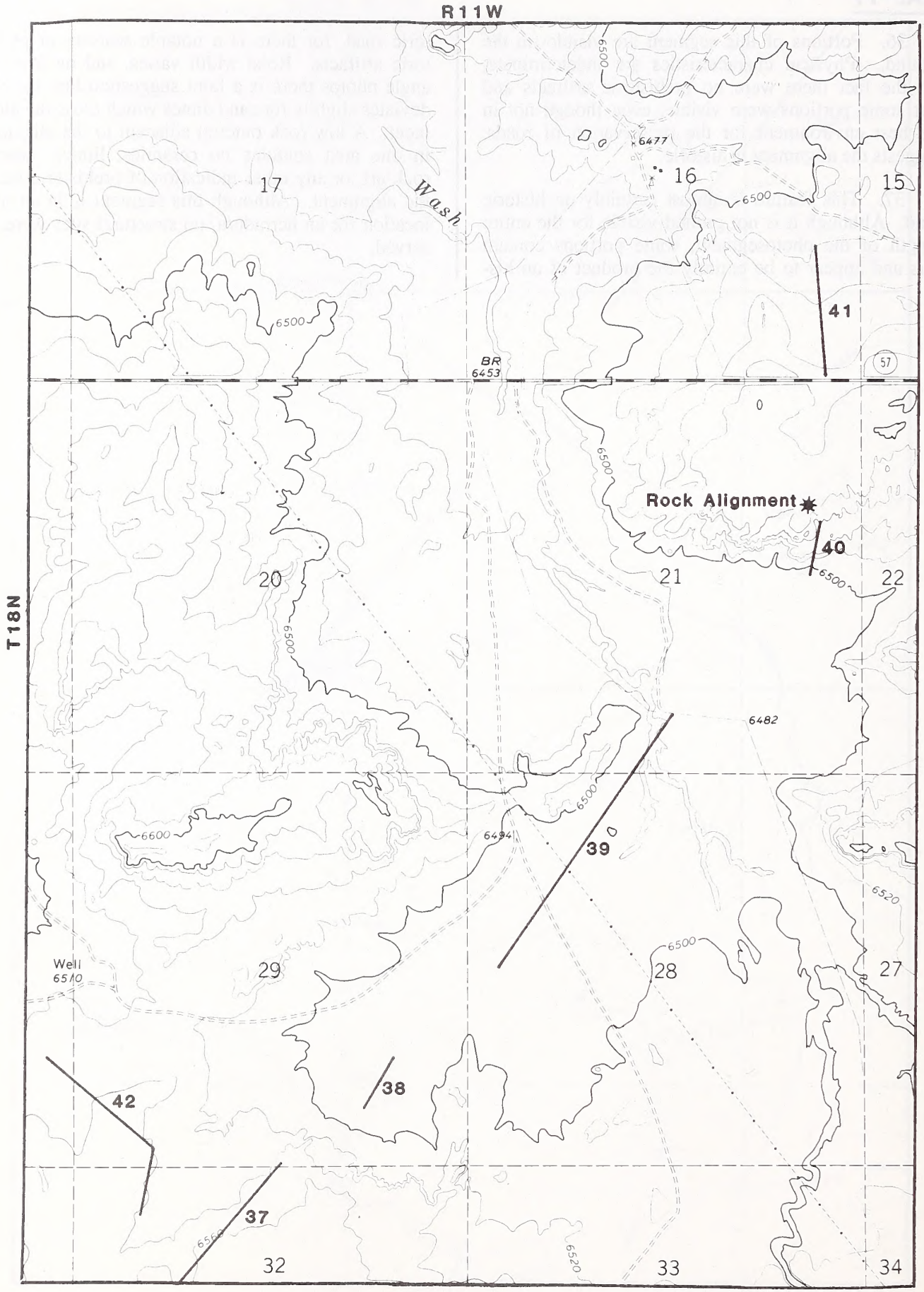

R12W R11W
T17N T18N
36
31
37
6560
6620
6600
6600
Flowing Well
6584
6660
6600
1
6645
6
×6703
6600
6700
6700
36
6712
6640
6760
6700
×6787
12
7
6700
6800
6800
6700
6847
6800
6860
6800
13
18

MAP 11

MAP 11

36. Portions of this segment are visible on the ground. Physical characteristics are indeterminate, but the fact there were no prehistoric artifacts and that some portions were visible, even though not in the best environment for the preservation of roads, suggests the alignment is historic.

37. This feature is almost certainly an historic road. Although it is not ground-visible for the entire length of the photosegment, some portions contain ruts and appear to be entirely the product of an historic road, for there is a notable scarcity of prehistoric artifacts. Road width varies, and on low-sun-angle photos there is a faint suggestion that the road deviates slightly for sand dunes which cross the alignment. A low rock outcrop adjacent to the alignment in one area contains no ceramics, lithics, hearths, rock art, or any other indication of prehistoric use of the alignment. Although this segment is in an ideal location for an herradura, no structural sites were observed.


R11W
T18N
17
16
15
20
21
22
29
28
27
32
33
34
Wash
BR
6453
6477
6500
6482
6494
6600
6520
6560
Rock Alignment
37
38
39
40
41
42
Well
6510
57

MAP 12

MAP 12

37. Interpreted as an historic road. See notes for Map 11.

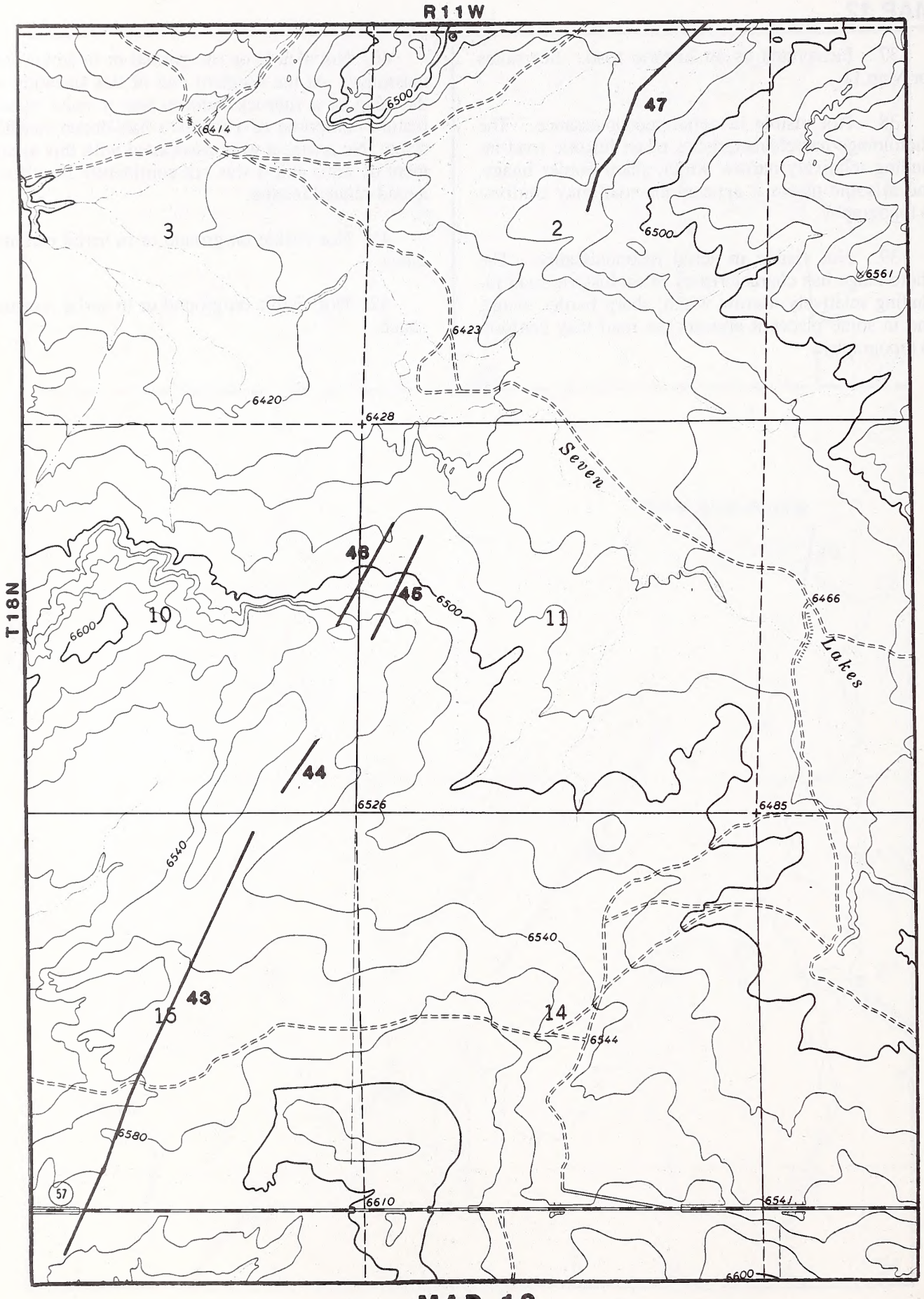
38. Not visible in aerial reconnaissance. The photoimage has characteristics of an historic road including relatively narrow width, sharp border image, and in some places it appears the road may conform to topography.

39. Not visible in aerial reconnaissance. The photoimage has characteristics of an historic road including relatively narrow width, sharp border image, and in some places it appears the road may conform to topography.

40. Not visible on the ground or in aerial reconnaissance. At the northern end of this lineation near the edge of a rimrock outcrop was a small masonry feature composed of perhaps a half-dozen sandstone slabs. No artifacts were associated with this arrangement of slabs and it was not confidently identified as a road-related feature.

41. Not visible on ground or in aerial reconnaissance.

42. Not visible on ground or in aerial reconnaissance.


R11W
T18N
47
48
45
44
43
6500
6414
6423
6420
6428
6561
6466
6600
6526
6485
6540
6544
6580
6610
6541
6600
3
2
10
11
15
14
Seven
Lakes
57

MAP 13

MAP 13

43. Not visible on ground or in aerial reconnaissance.

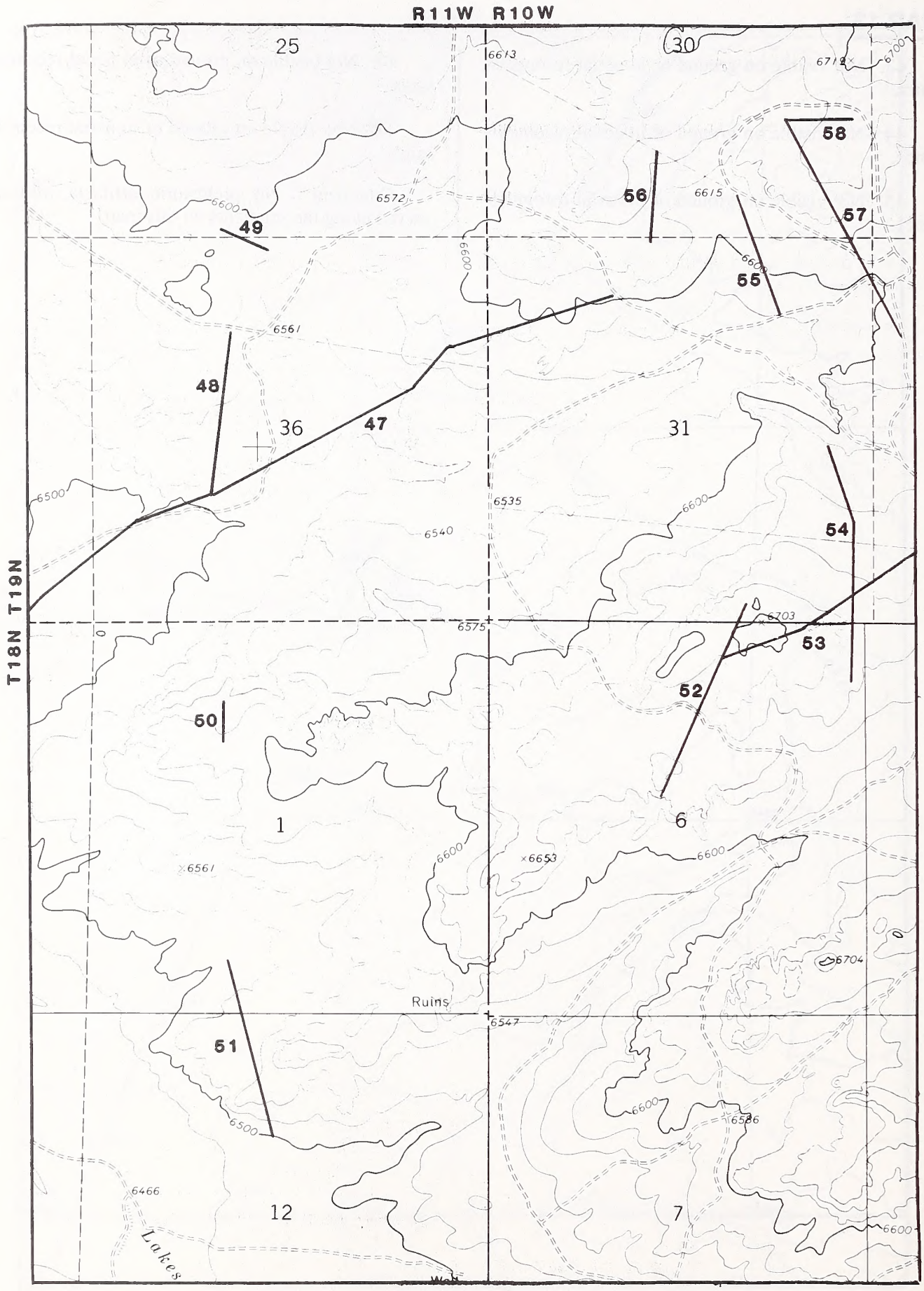
44. Not visible on ground or in aerial reconnaissance.

45. Not visible on ground or in aerial reconnaissance.

46. Not visible on ground or in aerial reconnaissance.

47. Not visible on ground or in aerial reconnaissance.

Comment: No prehistoric artifacts were observed along the segments on this map.


R11W R10W
T18N T19N
25
30
36
31
1
6
12
7
49
48
47
56
55
58
57
54
53
52
50
51
6613
6572
6615
6561
6535
6540
6575
6703
6653
6704
6547
6586
6466
Ruins
Lakes

MAP 14

MAP 14

47. Not visible on ground or in aerial reconnaissance.

48. Not visible on ground or in aerial reconnaissance.

49. Not visible on ground or in aerial reconnaissance.

50. Not visible on ground or in aerial reconnaissance.

51. Not visible on ground or in aerial reconnaissance.

52. Not visible on ground or in aerial reconnaissance.

53. See notes for Map 15.

54. Not visible on ground or in aerial reconnaissance.

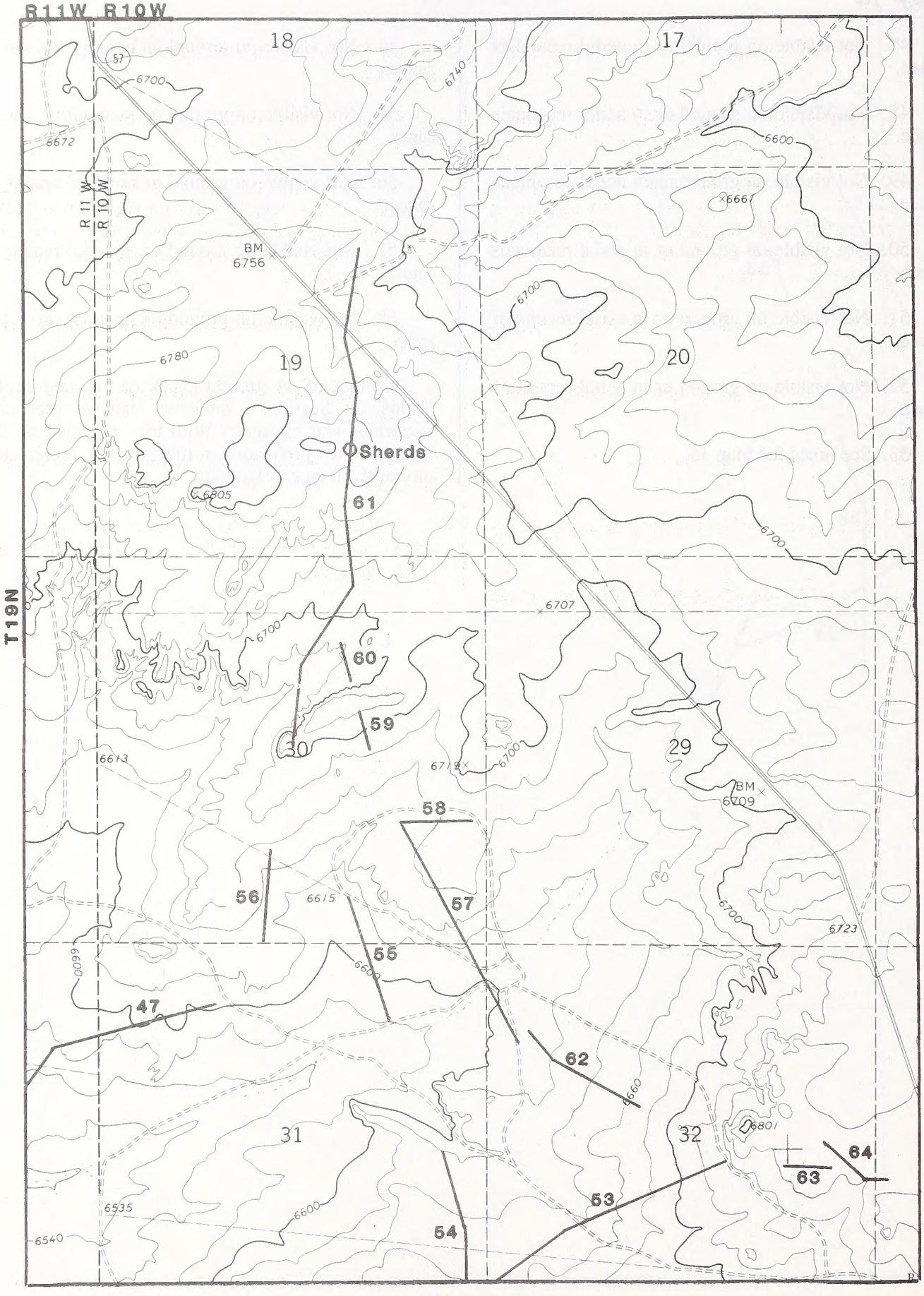
55. Not visible on ground or in aerial reconnaissance.

56. Not visible on ground or in aerial reconnaissance.

57. Not visible on ground or in aerial reconnaissance.

58. Not visible on ground or in aerial reconnaissance.

Comment: A ground check of the area marked "ruins" in Section 1 indicated that no prehistoric materials were present. With the exception of Segment 53, no prehistoric artifacts were found along any of the imaged segments.


R11W R10W
T19N
18
17
19
20
29
30
31
32
R 11 W
R 10 W
BM
6756
BM
6709
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6740
6600
6672
6661
6780
6805
6707
6713
6715
6615
6723
6699
6600
6535
6540
6801
6600
Sherds
61
60
59
58
56
57
55
47
62
64
63
53
54

MAP 15

MAP 15

47. Not visible on ground or in aerial reconnaissance.

53. Not visible on ground or in aerial reconnaissance. A single sherd was found approximately on the alignment within the historic road in the SW/4, Section 32. There was no other evidence of any prehistoric activity on this alignment. An abandoned two-track road parallels the plotted alignment for part of this segment, but it is not probable that the historic road was the imaged feature.

54. Not visible on the ground or in aerial reconnaissance.

55. Not visible on the ground or in aerial reconnaissance.

56. Not visible on the ground or in aerial reconnaissance.

57. Not visible on the ground or in aerial reconnaissance.

58. Not visible on the ground or in aerial reconnaissance.

59. Not visible on the ground or in aerial reconnaissance.

60. Not visible on the ground or in aerial reconnaissance.

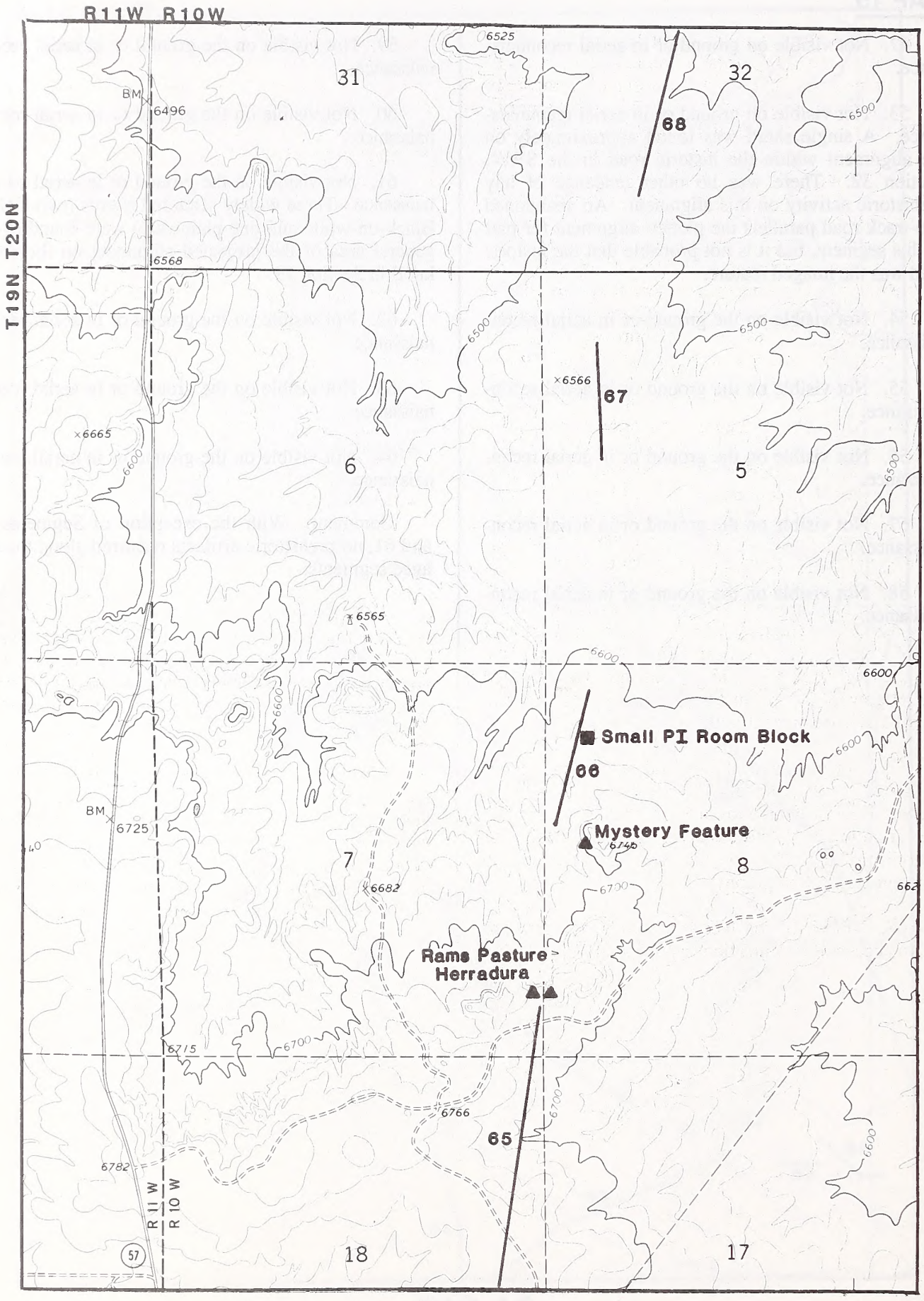
61. Not visible on the ground or in aerial reconnaissance. Three widely scattered sherds (two Gallup Black-on-white and one plainware) were found in the general area of the projected alignment on the small knoll in Section 19.

62. Not visible on the ground or in aerial reconnaissance.

63. Not visible on the ground or in aerial reconnaissance.

64. Not visible on the ground or in aerial reconnaissance.

Comment: With the exception of Segments 53 and 61, no prehistoric artifacts occurred along the imaged segments.


R11W R10W
T19N T20N
31
32
68
6525
BM
6496
6568
6500
6566
67
6665
6600
6
5
6565
Small PI Room Block
66
Mystery Feature
6745
BM
6725
7
8
6682
6700
Rams Pasture
Herradura
6715
6766
65
6782
R 11 W
R 10 W
57
18
17

MAP 16

Map 16

65. This alignment could not be definitely identified on the ground. At the extreme southern end of the alignment a small linear blowout of completely natural origin was present. On the edge of the northern terminus of the imaged segment is a notch which formed a prominent point on the horizon. The feature known as Rams Pasture Herradura is located in this notch. A ceramic scatter is present in the general area of this herradura. Sherds south of the herradura were marked with pin flags in an attempt to show their distribution corresponded to the imaged road alignment. Instead, the sherds were found to be distributed along the base of the cliff which extends eastward from the herradura. In short, we could find no identifiable road segment on the ground in this area.

66. A pre-Bonito Phase occupation is present in the general vicinity of this segment. No road segments could be identified on the ground, but another feature resembling an herradura, the Mystery Feature, was found a short distance east of the projected alignment near the southern terminus of the imaged segment. Several Gallup Black-on-white sherds were found in the immediate vicinity of this possible herradura. The imaged alignment also passes approximately 10 meters west of a small Pueblo I roomblock, as shown on the map. At this point the imaged road is sloping into an area informally termed the Highway 57 community. Numerous Anasazi roomblocks are present in the area.

67. Not visible on the ground or in aerial reconnaissance. Photolineation appears to be highly speculative. Ground examination showed no artifact concentration on the imaged segment and the visibility of the photolineation was not enhanced on low-sun-angle photography.

68. Not visible on the ground or in aerial reconnaissance. Photolineation appears to be highly speculative. Ground examination showed no artifact concentration on the imaged segment and the visibility of the photolineation was not enhanced on low-sun-angle photography.

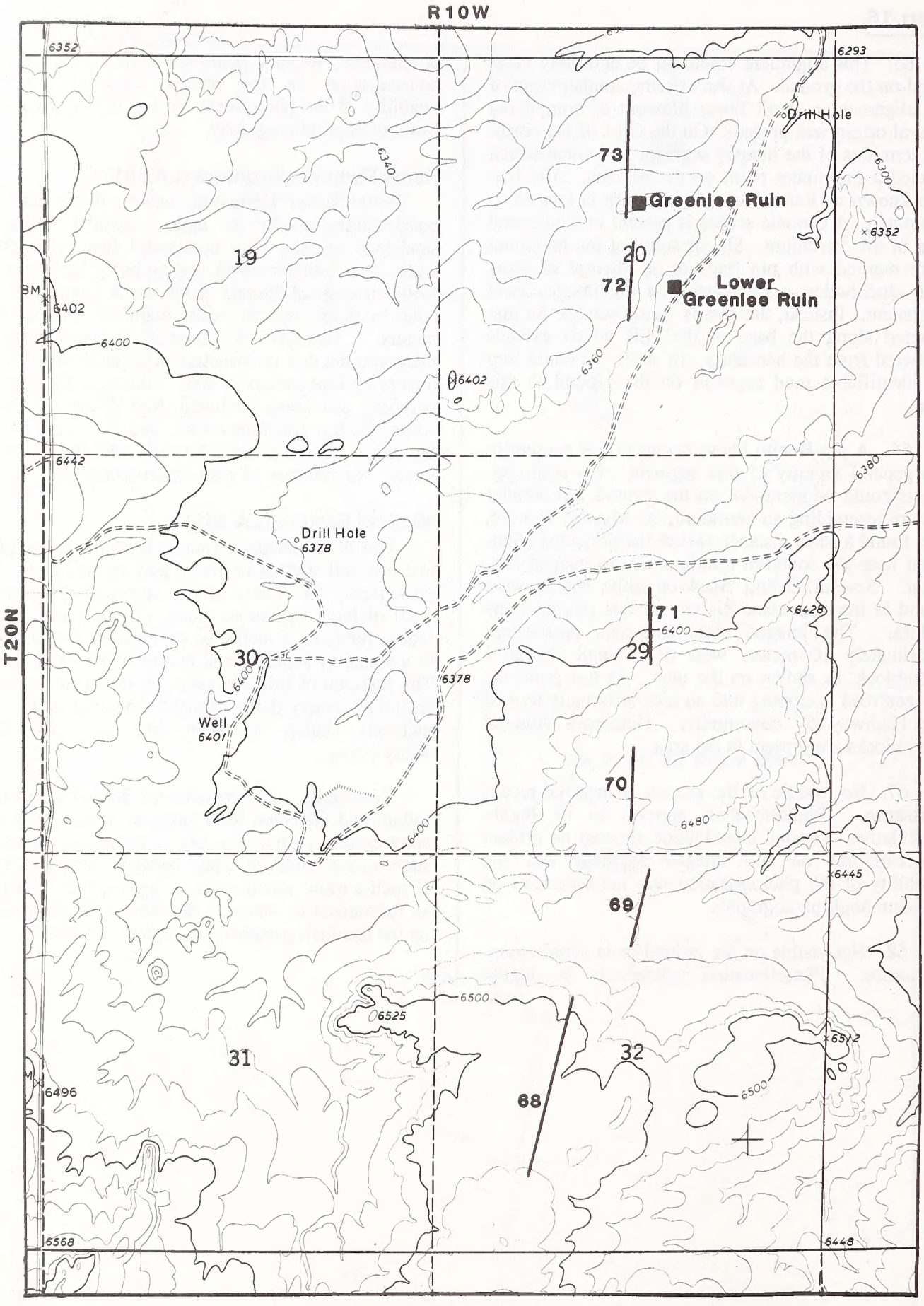
Rams Pasture Herradura (LA 38111)

Rams Pasture Herradura consists of two masonry constructions made of large, irregular slabs of sandstone stacked in a compound fashion to form walls .4 to .5 meters thick and probably less than one meter in original height. Structure A is roughly circular in shape with an inside diameter of about five meters. Structure B, located approximately 10 meters to the east of Structure A, is hook shaped, 6.5 meters by four meters in size. Pottery in the vicinity of these structures included Red Mesa Black-on-white, Gallup Black-on-white, and Escavada Black-on-white. Between Structures A and B is a slight swale. No evidence of road construction was seen.

Mystery Feature (LA 38112)

This is a U-shaped structure four meters by three-and-one-half meters in size, open to the west. Approximately 21 meters to the northeast is an alignment of large sandstone blocks on slickrock. These blocks range to .5 meters in size and are not arranged in a situation which would control the flow of water. The function of this alignment is unknown. A slight scatter of pottery in the immediate vicinity of the ruin included Gallup Black-on-white and corrugated utility wares.

Comments: The presence of Rams Pasture Herradura and Greenlee Ruin suggests a route was possibly present in this area, but no physical evidence of such a road could be found between these two sites. If such a route was present, it appears that it was not as formalized as many of the other prehistoric roads on the southern periphery of the San Juan Basin.


R10W
T20N
6352
6293
Drill Hole
73
Greenlee Ruin
6340
6300
19
20
72
Lower
Greenlee Ruin
BM
6402
6352
6400
6360
6402
6442
6380
Drill Hole
6378
71
6400
6428
30
6400
6378
29
Well
6401
70
6480
6400
6445
69
6500
6525
31
32
6512
6496
68
6500
6568
6448

MAP 17

MAP 17

68. Not visible on ground or in aerial reconnaissance. Photolineation appears to be highly speculative. Ground examination showed no artifact concentration on the imaged segment and the visibility of the photolineation was not enhanced on low-sun-angle photography.

69. Not visible on ground or in aerial reconnaissance. Photolineation appears to be highly speculative. Ground examination showed no artifact concentration on the imaged segment and the visibility of the photolineation was not enhanced on low-sun-angle photography.

70. Not visible on ground or in aerial reconnaissance. Photolineation appears to be highly speculative. Ground examination showed no artifact concentration on the imaged segment and the visibility of the photolineation was not enhanced on low-sun-angle photography.

71. Not visible on ground or in aerial reconnaissance. Photolineation appears to be highly speculative. Ground examination showed no artifact concentration on the imaged segment and the visibility of the photolineation was not enhanced on low-sun-angle photography.

72. Not visible on ground or in aerial reconnaissance. Photolineation appears to be highly speculative. Ground examination showed no artifact concentration on the imaged segment and the visibility of the photolineation was not enhanced on low-sun-angle photography.

73. Not visible on ground or in aerial reconnaissance. Photolineation appears to be highly speculative. Ground examination showed no artifact concentration on the imaged segment and the visibility of the photolineation was not enhanced on low-sun-angle photography.

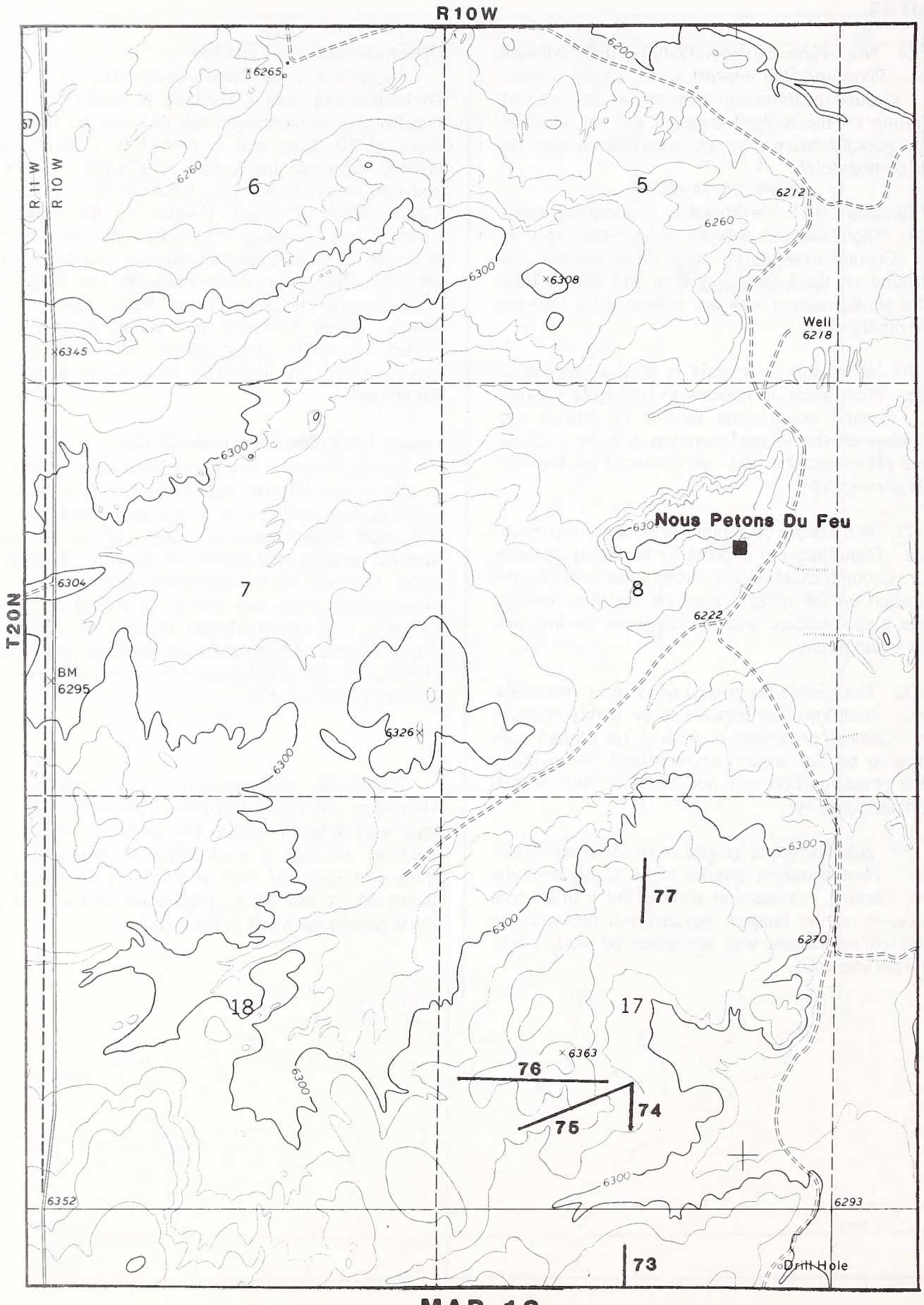
Greenlee Ruin (LA 35418)

Greenlee is a late Bonito Phase structure of 16 to 18 single-story rooms flanking a blocked-in kiva. Descriptions of structural remains can be found in Stein (1979), Stein and Levine (1983:C-38-40) and Powers, Gillispie and Lekson (1983:186, 190-191). The Greenlee Ruin has long been considered the first outpost south of Chaco Canyon on the Southeast Road. Thus, a modest effort was expended by the Phase II crew to locate alignments connecting this ruin with Chaco Canyon (presumably Una Vida, Kin Nahasbas, or Hugo Pavi) and Rams Pasture Herradura. Both Greenlee and Rams Pasture were visited repeatedly during sunrise and sunset conditions; however, the alignment could not be located on the ground.

Lower Greenlee Ruin (LA 35419)

Lower Greenlee is a tower kiva structure similar in size to Kin Klizhin and Upper Kin Klizhin. The building was reduced to a massive rubble mound with wall alignments much more difficult to trace than the standing architecture of the sister structures. Early morning aerial reconnaissance showed the characteristic tower and surface kiva clearly. Lower Greenlee was located during Phase I of the Chaco Roads Project and is described by Stein and Levine (1983:C-36-38) and discussed by Kincaid, Stein and Levine (1983:9,16-17).

Comment: The presence of the Rams Pasture Herradura and Upper Greenlee Ruin suggest a route may have been present in this area, but no physical evidence of such a road could be found between these two sites. If such a route was present, it appears that it was not as formalized as many of the other prehistoric roads in the area.


R10W
R 11 W
R 10 W
T20N
6265
6200
6260
6212
6308
6300
6345
Well
6218
Nous Petons Du Feu
6304
6222
BM
6295
6326
6270
77
76
74
75
73
6363
6352
6293
Drill Hole
6
5
7
8
18
17

MAP 18

MAP 18

73. Not visible on ground or in aerial reconnaissance. See comments for Map 17.

74. Photointerpreted only.

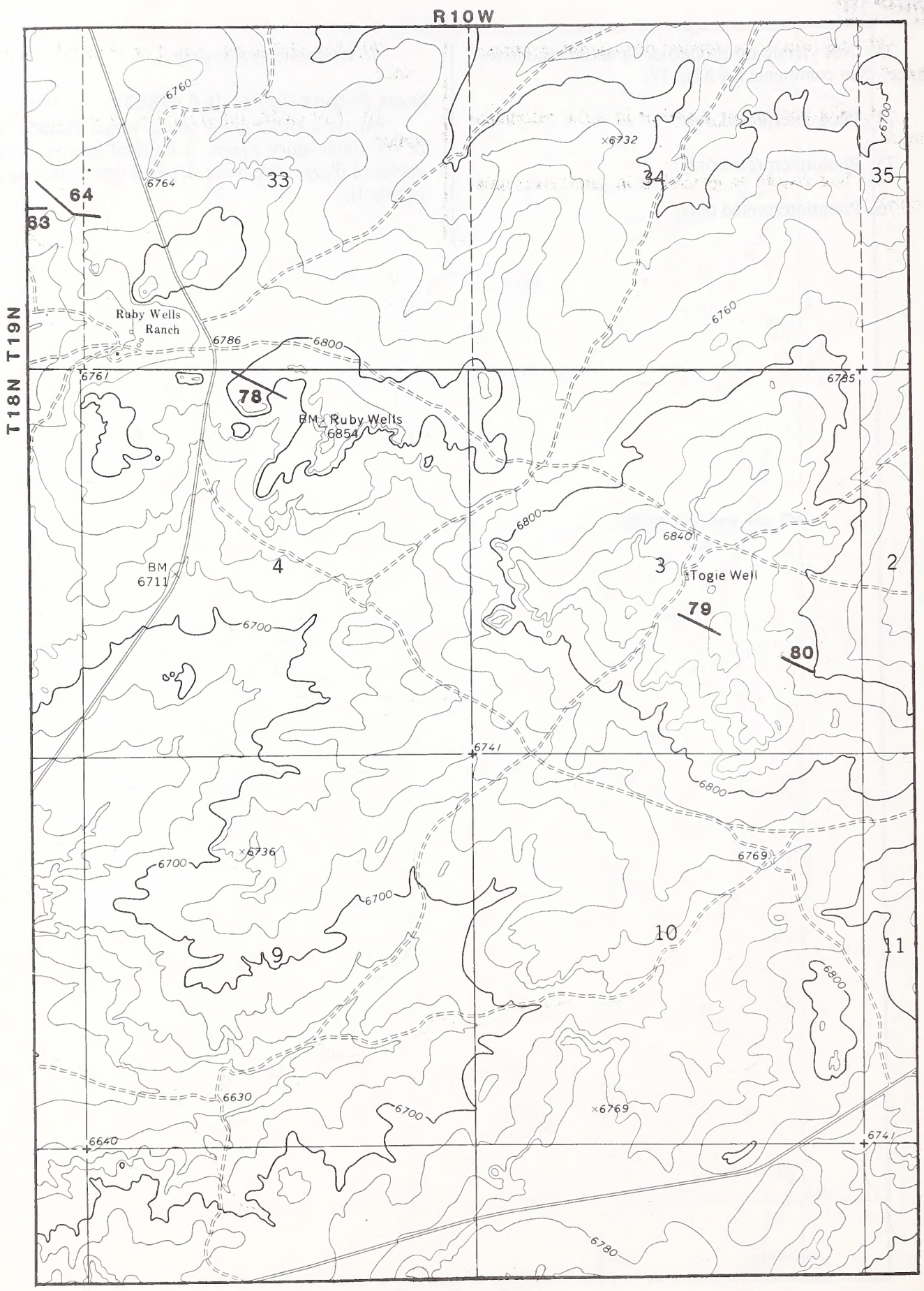
75. Photointerpreted only.

76. Photointerpreted only.

77. Photointerpreted only.

Nous Petons Du Feu (LA 47859)

This is a small great house which includes five or six single-story rooms, a blocked-in kiva, and an enclosed plaza. See more detailed description in Appendix II.


R10W
T18N T19N
33
34
35
4
3
2
9
10
11
64
63
78
79
80
Ruby Wells Ranch
BM Ruby Wells 6854
BM 6711
Togie Well
6760
6764
6786
6800
6761
6785
6840
6700
6741
6736
6769
6630
6640
6780
×6732
×6769

MAP 19

MAP 19

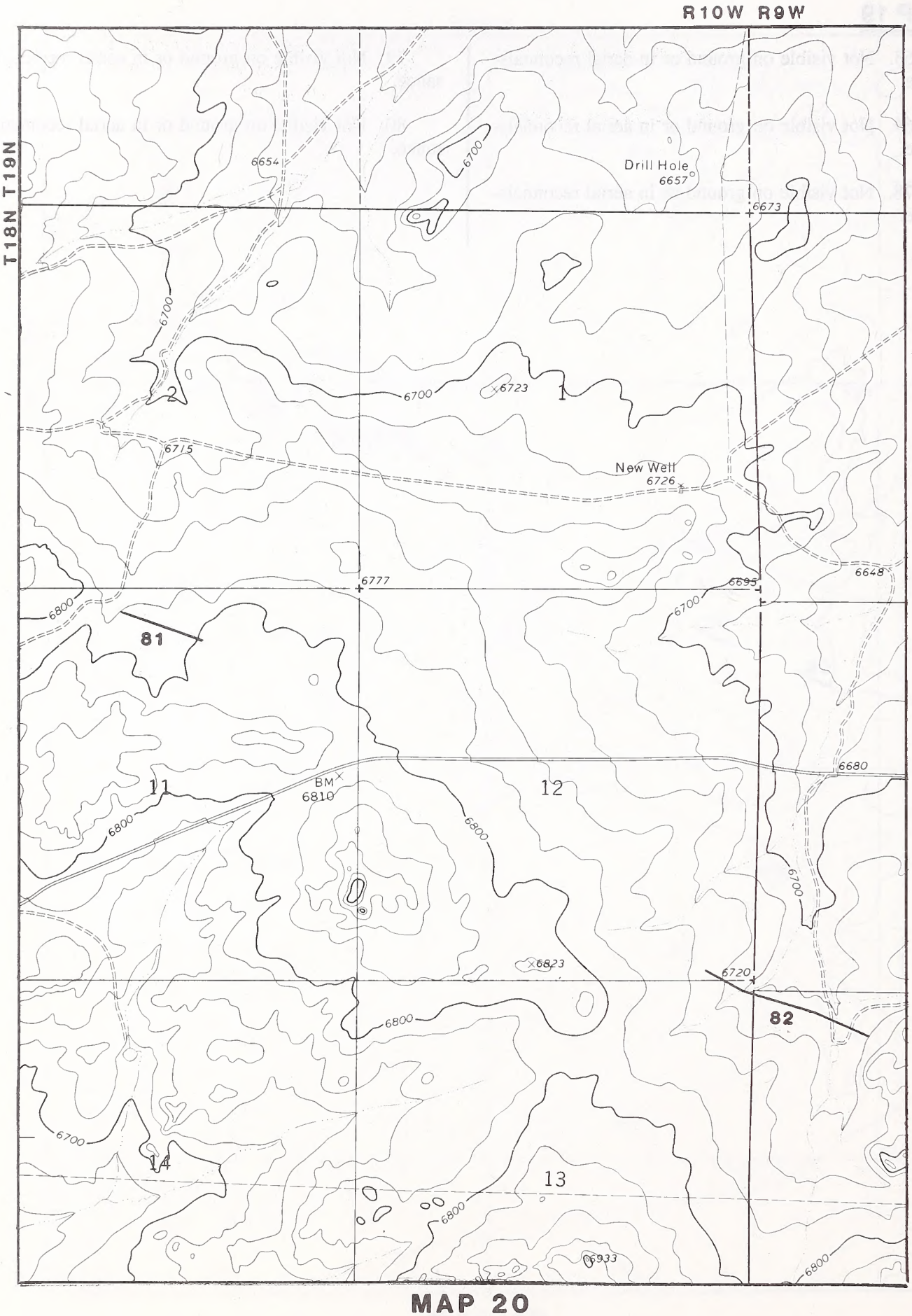
63. Not visible on ground or in aerial reconnaissance.

64. Not visible on ground or in aerial reconnaissance.

78. Not visible on ground or in aerial reconnaissance.

79. Not visible on ground or in aerial reconnaissance.

80. Not visible on ground or in aerial reconnaissance.

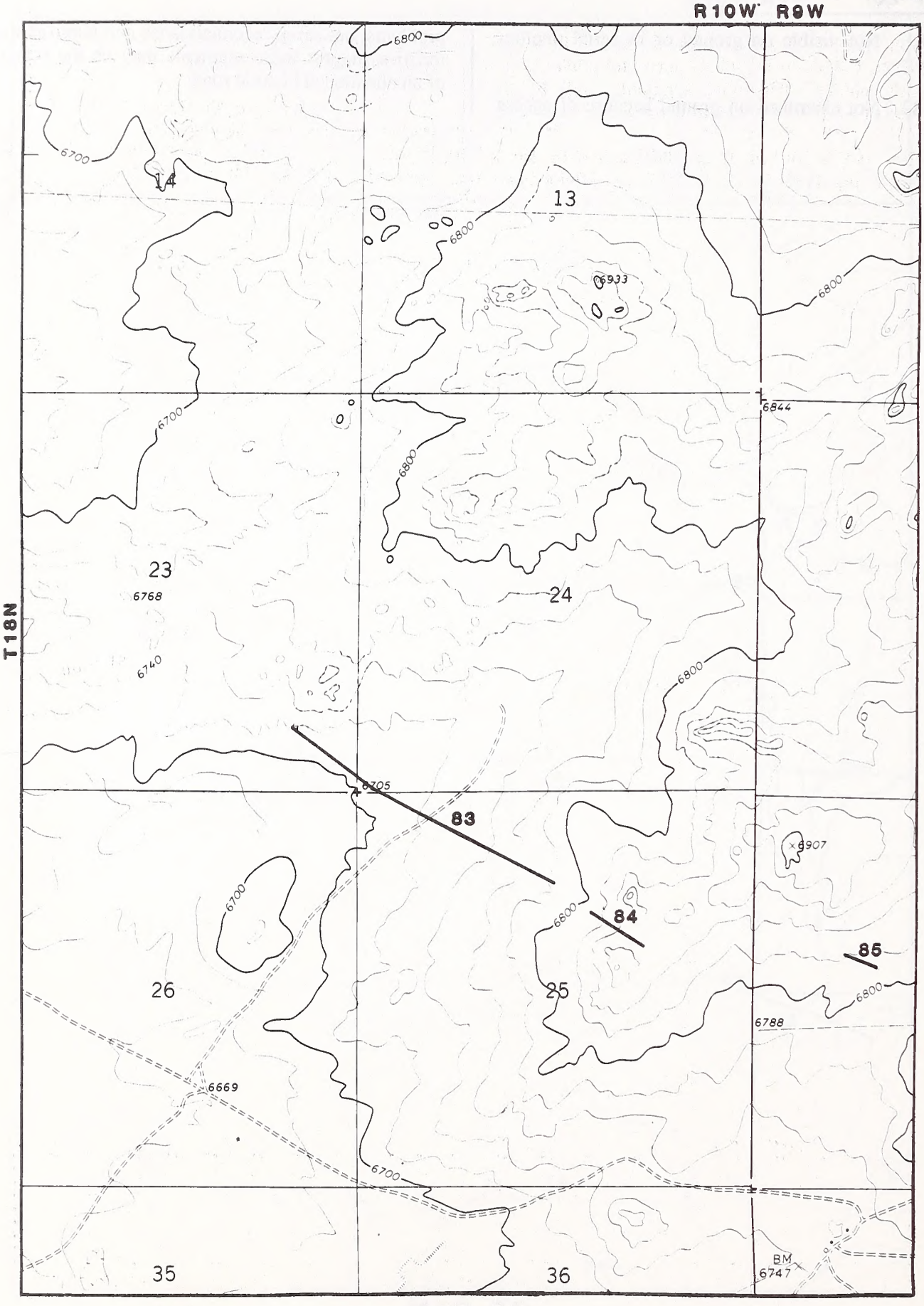

R10W R9W
T18N T19N
6654
6700
Drill Hole
6657
6673
6700
6700
6723
1
2
6715
New Well
6726
6777
6695
6648
6800
6700
81
11
BM
6810
12
6680
6800
6800
6700
6823
6720
82
6800
6700
14
13
6800
6933
6800

MAP 20

MAP 20

81. Not visible on ground or in aerial photography.

82. Not examined on ground because of access problems, but aerial reconnaissance and photo characteristics suggest these segments may be the remains of an abandoned historic road.


R10W
R9W
T18N
14
13
23
24
26
25
35
36
6800
6700
6933
6844
6768
6740
6705
83
84
85
6907
6788
6669
BM
6747

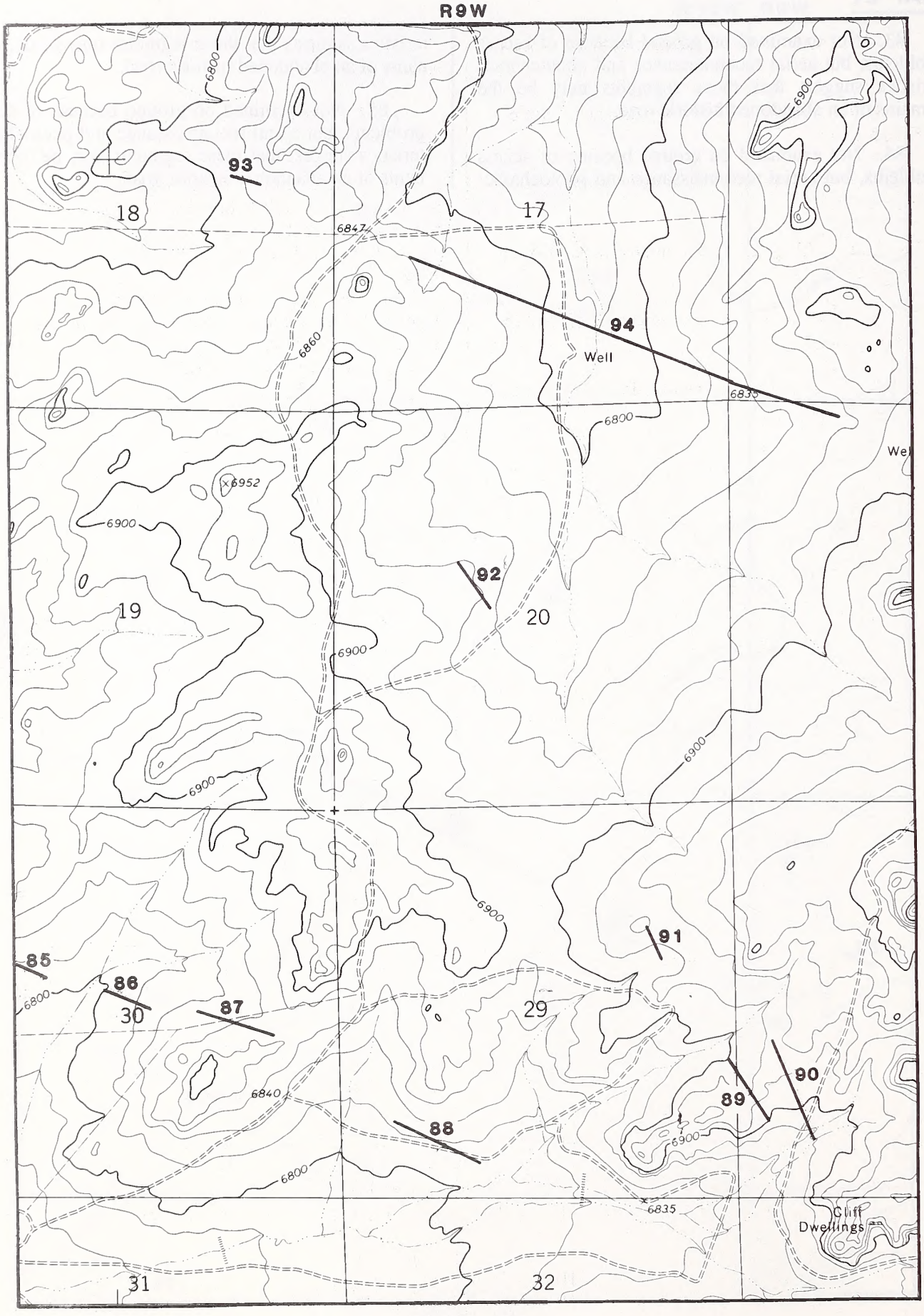
MAP 21

MAP 21

83. Not examined on ground because of access problems, but aerial reconnaissance and photocharacteristics suggest that these segments may be the remains of an abandoned historic road.

84. Not examined on ground because of access problems, but aerial reconnaissance and photocharacteristics suggests that these segments may be the remnants of an abandoned historic road.

85. Not examined on ground because of access problems, but aerial reconnaissance and photocharacteristics suggest that these segments may be the remnants of an abandoned historic road.


R9W
93
18
17
6847
94
Well
6860
6800
6835
6952
6900
92
19
20
85
86
30
87
29
91
6840
88
89
90
6835
Cliff
Dwellings
31
32

MAP 22

MAP 22

85. Not visible in aerial reconnaissance. Not examined on ground.

86. Not visible in aerial reconnaissance. Not examined on ground.

87. Not visible in aerial reconnaissance. Not examined on ground.

88. Not visible in aerial reconnaissance. Not examined on ground.

89. Not visible in aerial reconnaissance. Not examined on ground.

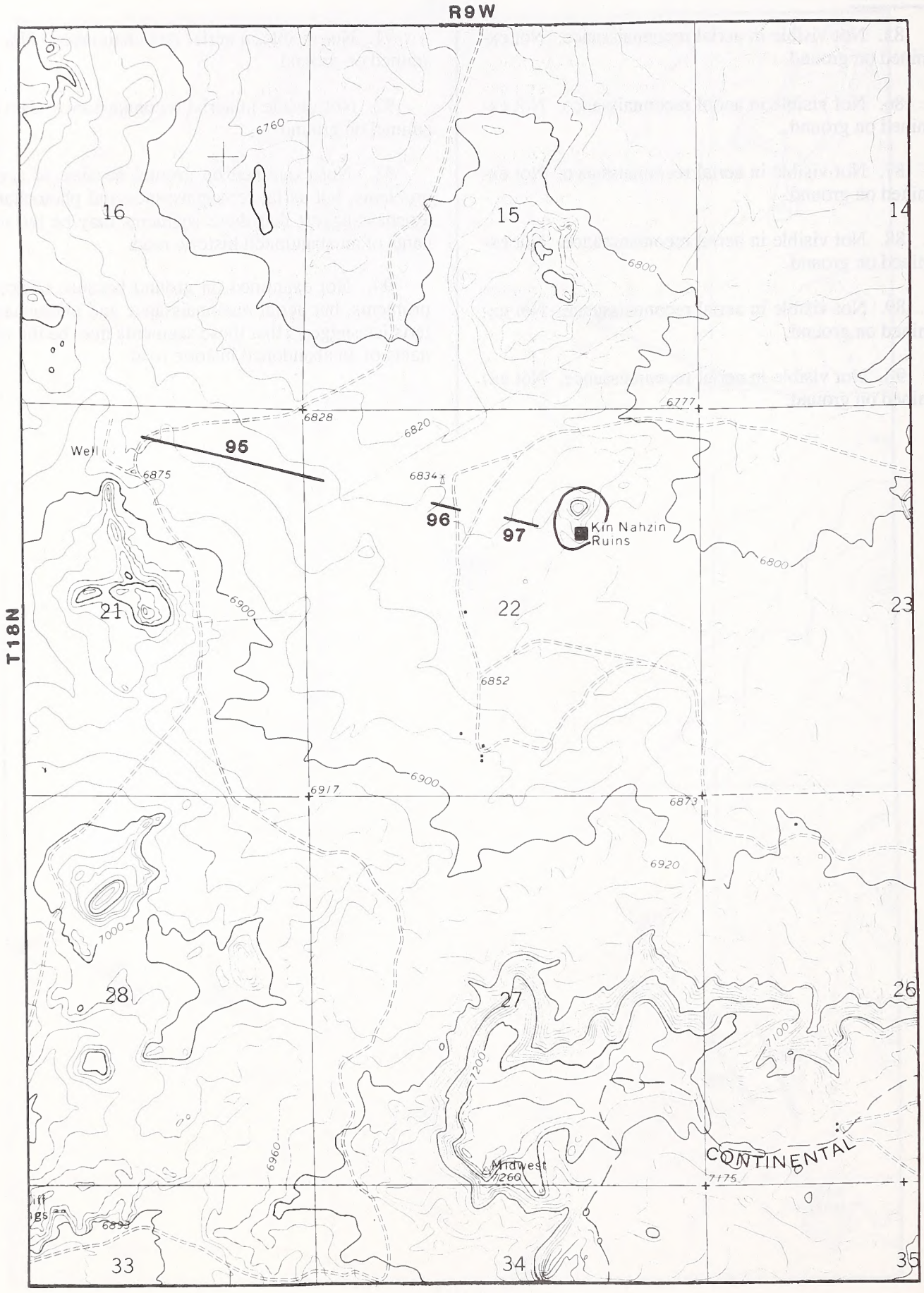
90. Not visible in aerial reconnaissance. Not examined on ground.

91. Not visible in aerial reconnaissance. Not examined on ground.

92. Not visible in aerial reconnaissance. Not examined on ground.

93. Not examined on ground because of access problems, but aerial reconnaissance and photocharacteristics suggest that these segments may be the remnants of an abandoned historic road.

94. Not examined on ground because of access problems, but aerial reconnaissance and photocharacteristics suggests that these segments may be the remnants of an abandoned historic road.


R9W
T18N
16
15
14
21
22
23
28
27
26
33
34
35
6760
6800
6828
6820
6777
Well
95
6875
6834
96
97
Kin Nahzin
Ruins
6800
6900
6852
6917
6900
6873
6920
7000
7100
7200
6960
Midwest
7260
CONTINENTAL
7175
6895

MAP 23

MAP 23

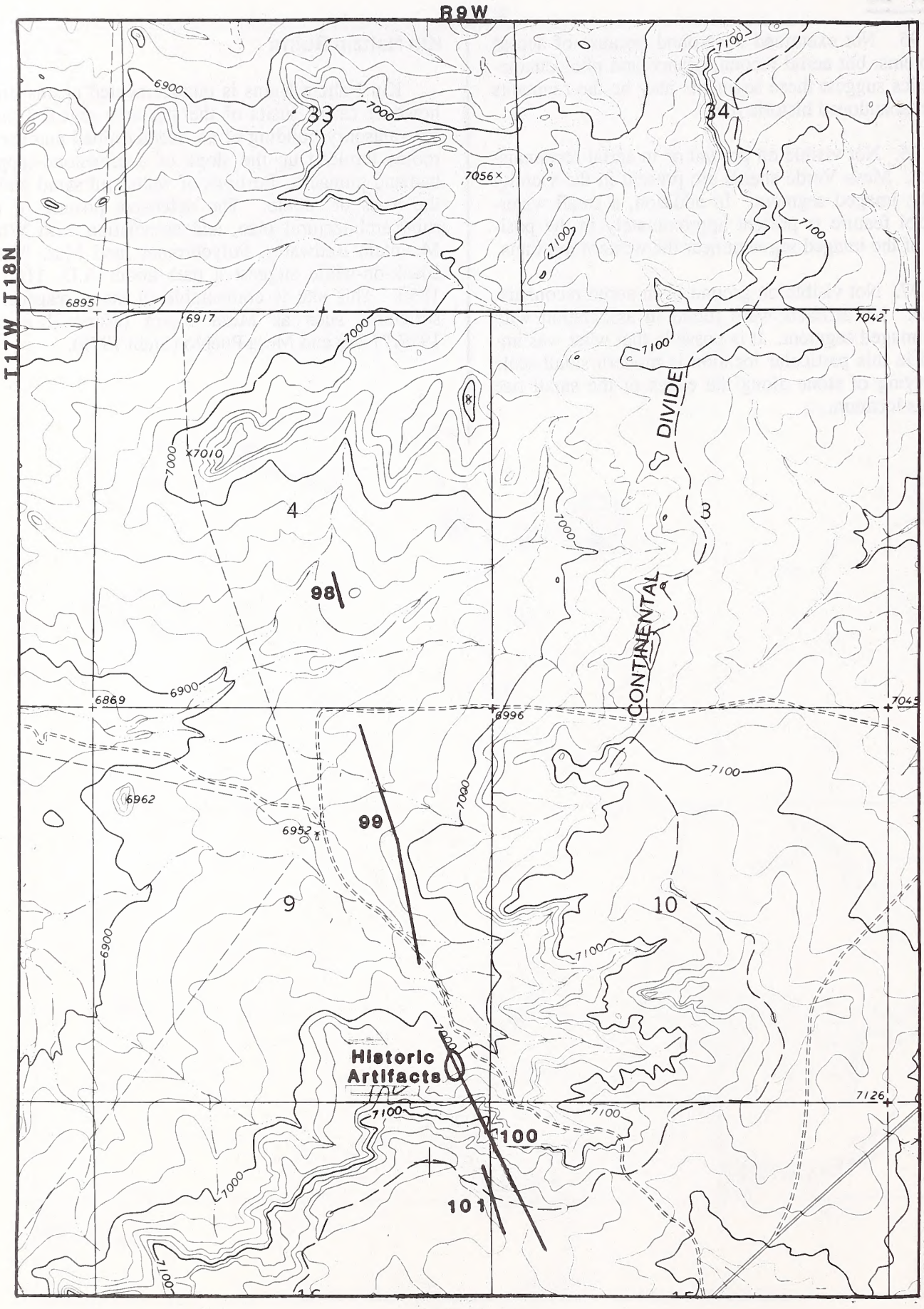
95. Not examined on ground because of access problems, but aerial reconnaissance and photocharacteristics suggest these segments may be the remnants of an abandoned historic road.

96. Not visible on ground or in aerial reconnaissance. Mesa Verde sherds are present in the vicinity of the imaged segment. In addition, a small water-control feature is present approximately in the position of the imaged segment near the western terminus.

97. Not visible on ground or in aerial reconnaissance. No artifacts were found in association with this imaged segment. It is possible that what was imaged in this particular location is modern small-scale quarrying of stone along the edges of the small rise in this location.

Kin Nahzin Ruins

Kin Nahzin Ruins is undocumented at this time, however casual visits of the site area reveal a massive masonry building of an undetermined number of rooms terraced up the slope of a sandstone-capped badland pinnacle. Portions of walls still stand within the mass of rubble. The defensive posture of the ruin, architectural plan, and association with White Mountain Redwares, Polychromes, and Mesa Verde Black-on-white suggest a date about A.D. 1150 to 1250. This site is comparable in many respects to structures such as Mesa Tierra (Marshall et al., 1979:77-79) and Mesa Pueblo (Stein 1979).


R9W
T17W T18N
33
34
4
3
9
10
98
99
100
101
DIVIDE
CONTINENTAL
Historic
Artifacts
6900
7000
7100
6895
6917
7042
7056
7010
6869
6996
7045
6962
6952
7126

MAP 24

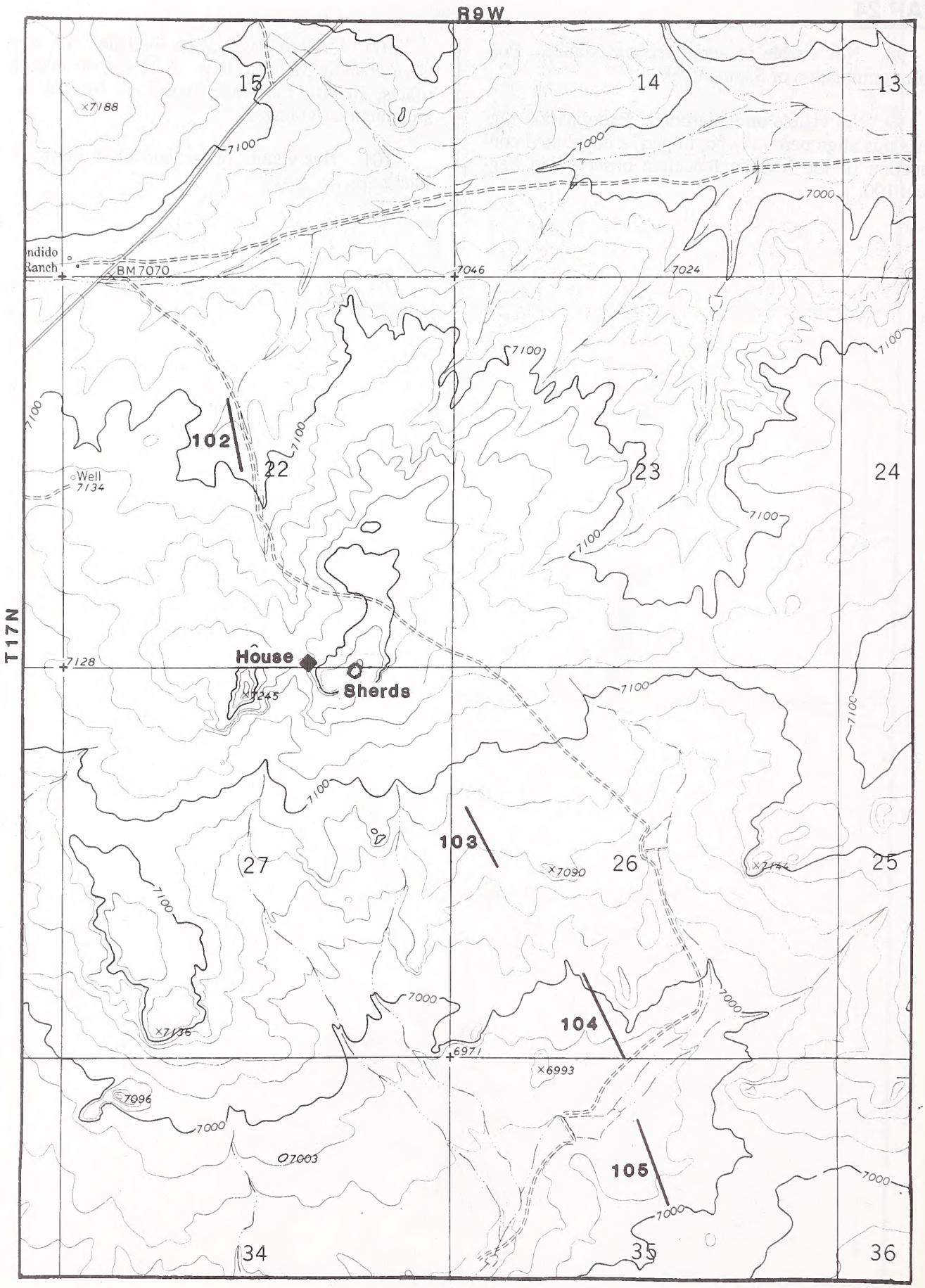
MAP 24

98. Not visible in aerial reconnaissance. Possible continuation of Segment 99.

99. Not visible on the ground. Examination suggests this alignment may be, in part, a misplotted continuation of the historic fenceline observed in Segment 100.

100. Ground observation indicates this segment is an abandoned fence line. A cluster of historic artifacts, mainly machinery parts, is located on the alignment as indicated.

101. Not visible on ground or in aerial reconnaissance.


R9W
T17N
15
14
13
22
23
24
27
26
25
34
35
36
102
103
104
105
House
Sherds
Well
7134
BM 7070
7046
7024
7128
7188
7100
7000
7090
7136
6971
6993
7096
7003
7345

MAP 25

MAP 25

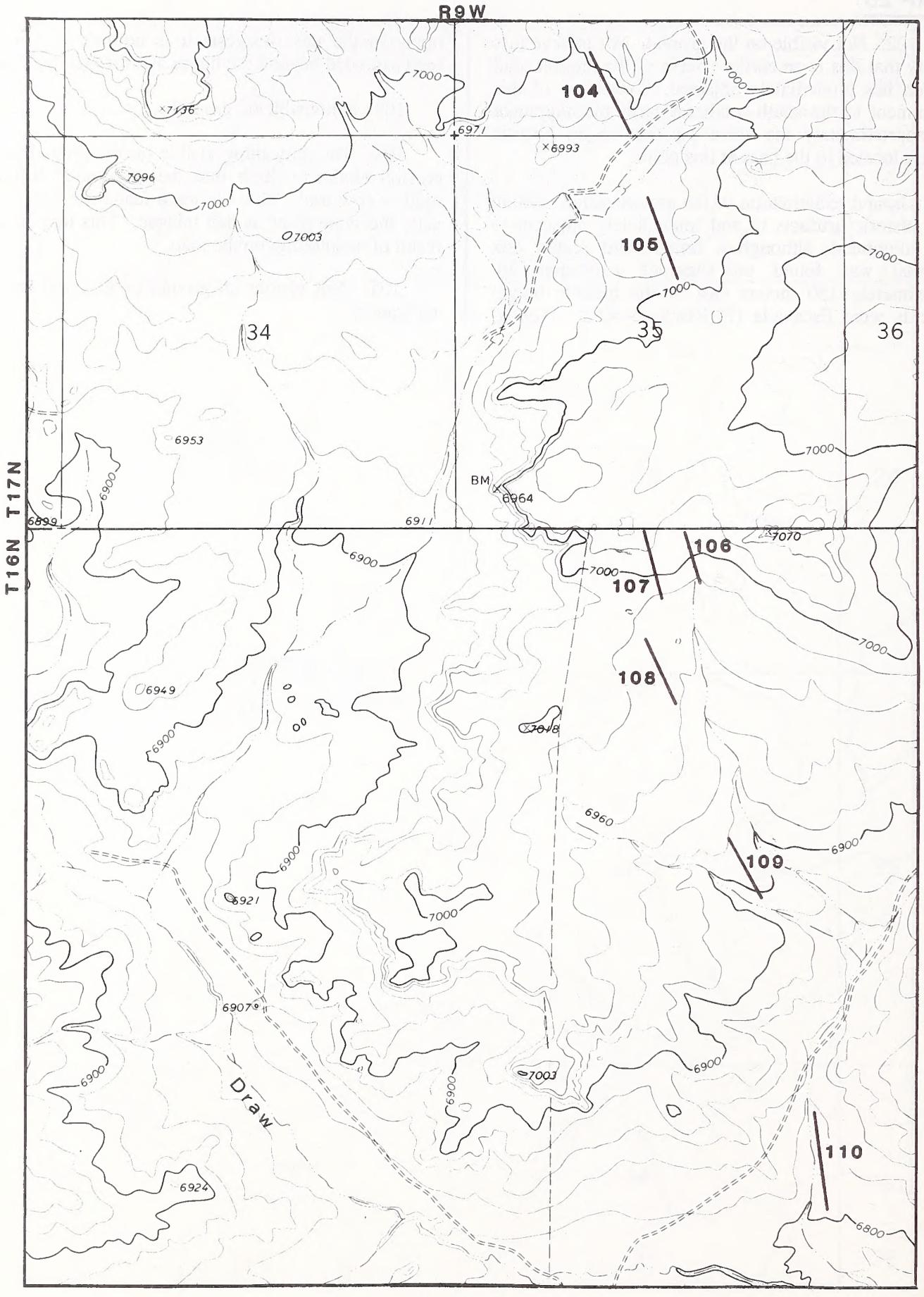
102. Not visible on the ground. We believe it is likely that this is an earlier course of the present road which lies immediately adjacent. Projection of this alignment to the south-southeastplaces the alignment in approximately the same position as an historic house located in the pass at this point.

Ground examination of the area revealed nothing but historic artifacts in and immediately adjacent to the alignment, although a small sherd scatter (six sherds) was found on slickrock exposures approximately 150 meters east of the historic house. Sherds were Escavada (?) Black-on-white. Topography in the pass suggests it is unlikely a historic road extended beyond the house and through the pass.

103. Not visible on ground.

104. The only thing visible on the ground is an erosion channel which may be an eroded historic road or cow trail. This erosional feature is not in exactly the same place as that imaged. This may be the result of misplotting on the map.

105. Not visible on ground or in aerial reconnaissance.


R9W
T16N T17N
104
105
106
107
108
109
110
34
35
36
BM
6964
6971
6911
6899
6953
6949
6921
6907
6924
7096
7136
6993
7003
7070
7018
6960
Draw

MAP 26

MAP 26

104. Presumed to be an eroded historic road or cow trail. See notes for Map 25.

105. Not visible on ground or in aerial reconnaissance.

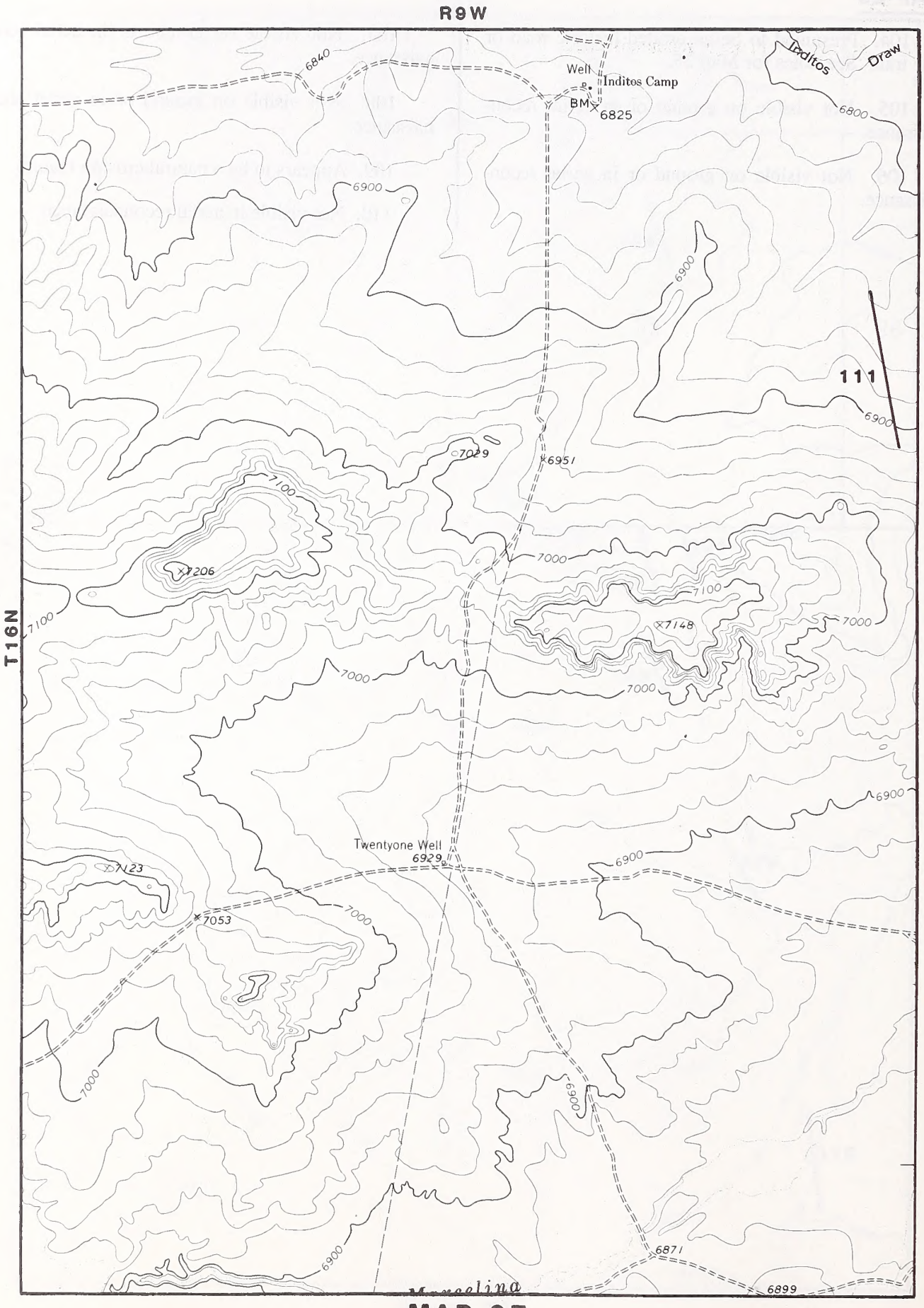
106. Not visible on ground or in aerial reconnaissance.

107. Not visible on ground or in aerial reconnaissance.

108. Not visible on ground or in aerial reconnaissance.

109. Appears to be a natural erosion feature.

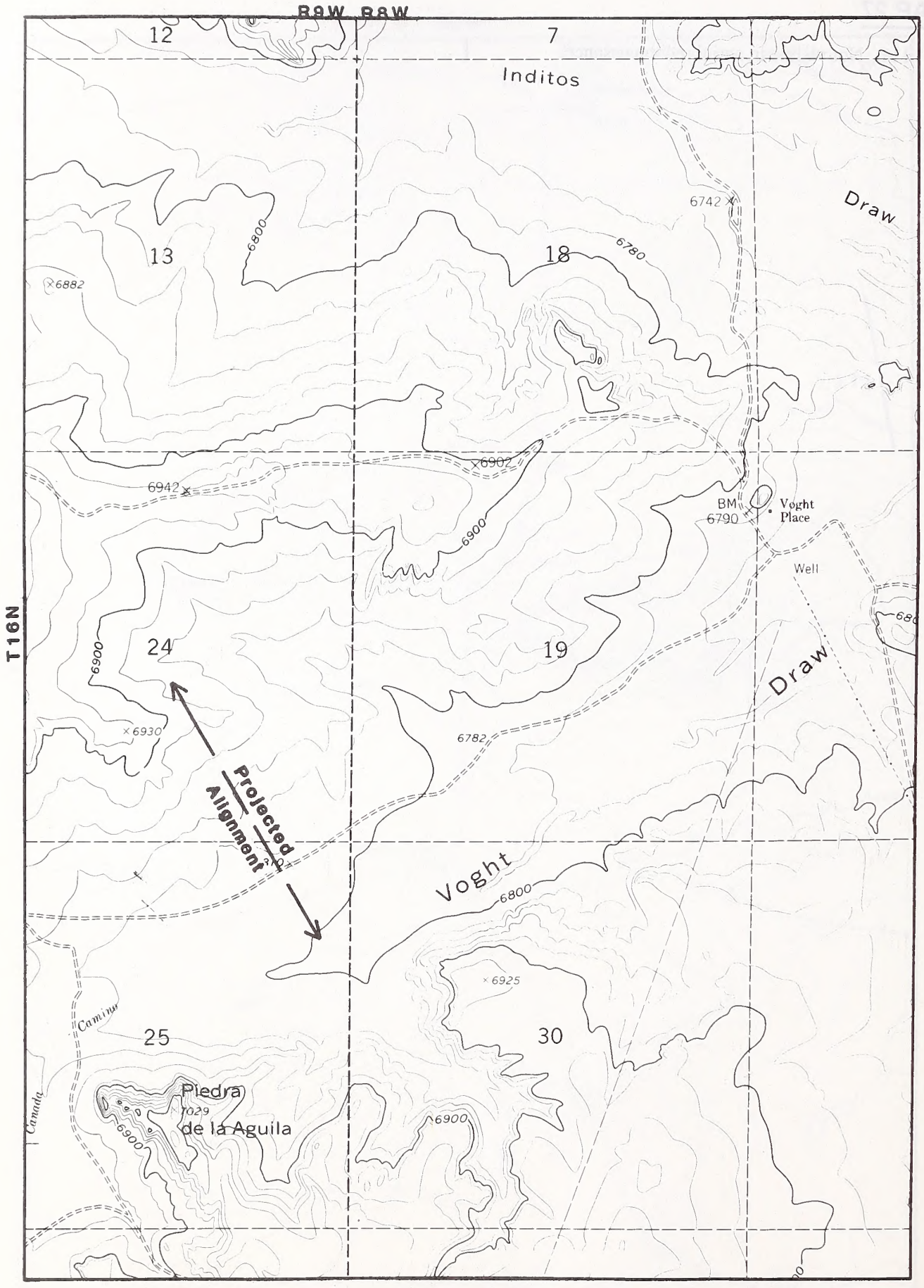
110. Not visible in aerial reconnaissance.


R9W
T16N
Well
Inditos Camp
BM
6825
Inditos Draw
6840
6800
6900
7029
6951
111
7100
7206
7000
7148
Twentyone Well
6929
7123
7053
6871
6899

MAP 27

MAP 27

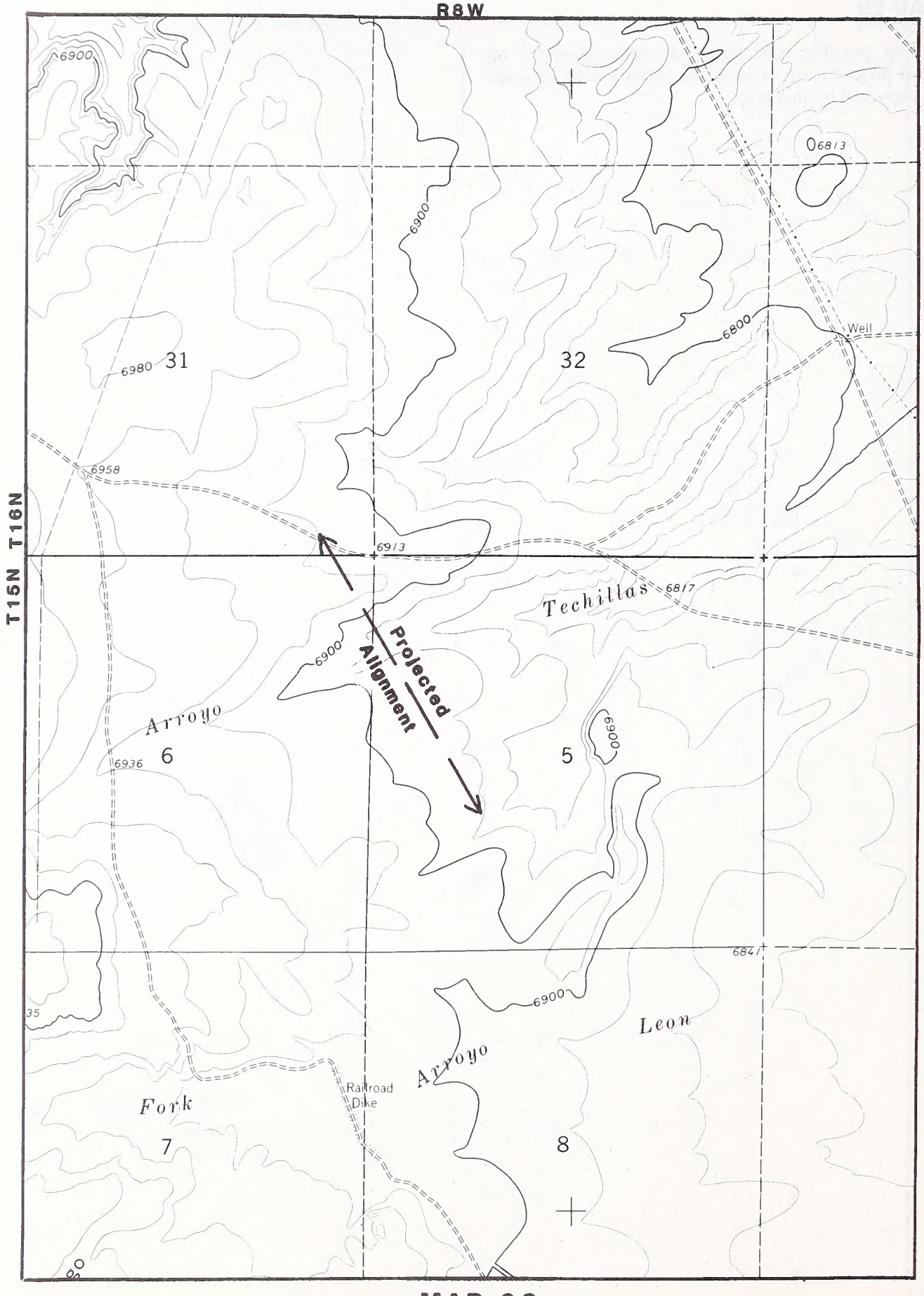
111. Not visible in aerial reconnaissance.


R9W R8W
12
7
Inditos
Draw
13
18
6742
6800
6780
6882
6902
6942
BM
6790
Voght
Place
Well
6900
T16N
24
19
Draw
6930
6782
Projected
Alignment
Voght
6800
6925
Camino
25
30
Piedra
7029
de la Aguila
Canada
6900

MAP 28

MAP 28

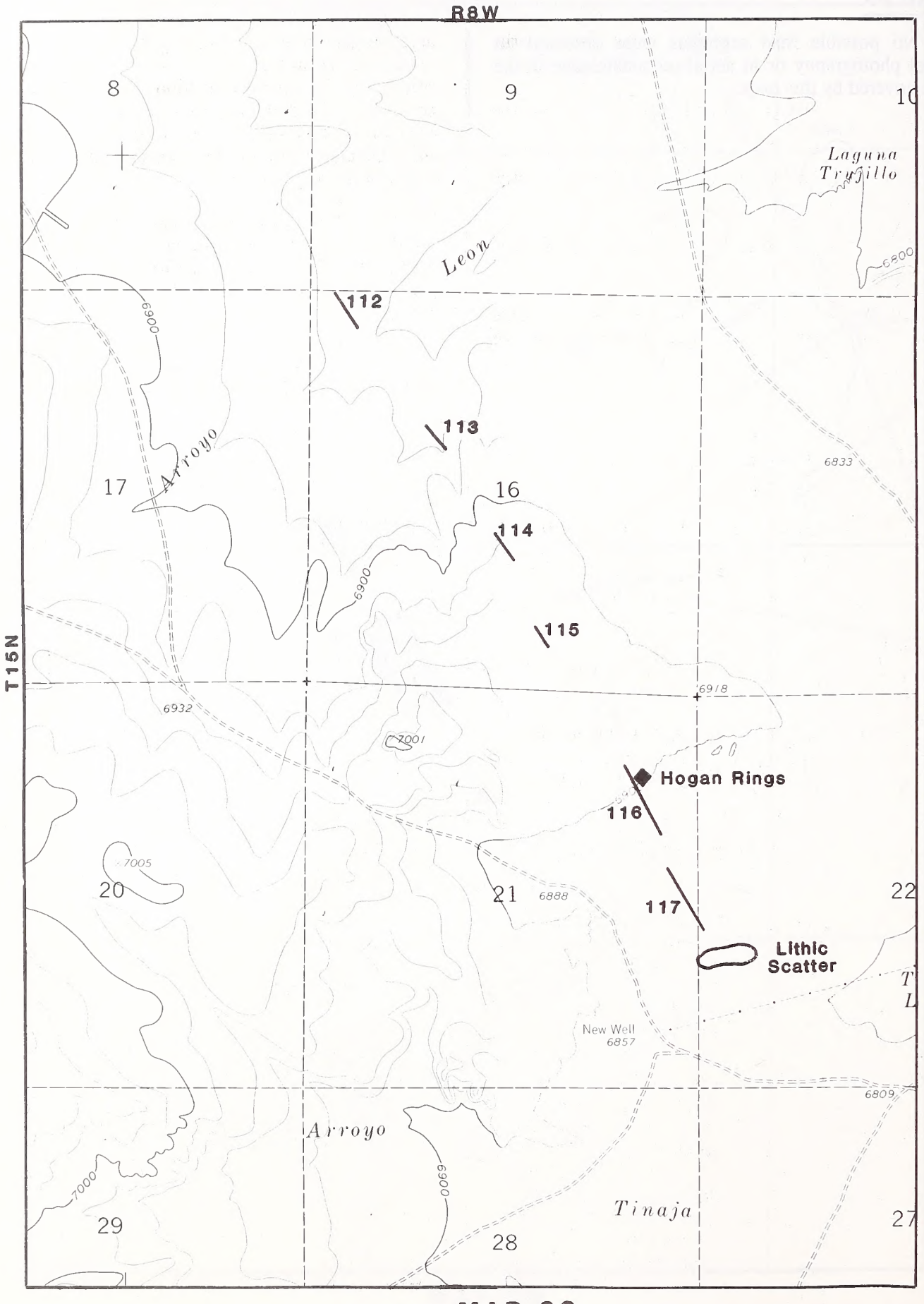
No possible road segments were observed on aerial photography or in aerial reconnaissance in the area covered by this map.


R8W
T15N T16N
6900
6813
6900
6800
Well
6980
31
32
6958
6913
Techillas
6817
Projected
Alignment
6900
Arroyo
6936
6
5
6900
6841
35
6900
Leon
Arroyo
Railroad
Dike
Fork
7
8

MAP 29

MAP 29

No possible road segments were observed on aerial photography or in aerial reconnaissance in the area covered by this map.


R8W
T15N
8
9
10
17
16
20
21
22
29
28
27
Laguna Trujillo
Leon
Arroyo
Arroyo
Tinaja
112
113
114
115
116
117
Hogan Rings
Lithic Scatter
New Well
6857
6900
6800
6833
6918
6932
7001
6888
7005
7000
6809

MAP 30

MAP 30

112. Not visible or highly speculative in aerial reconnaissance.

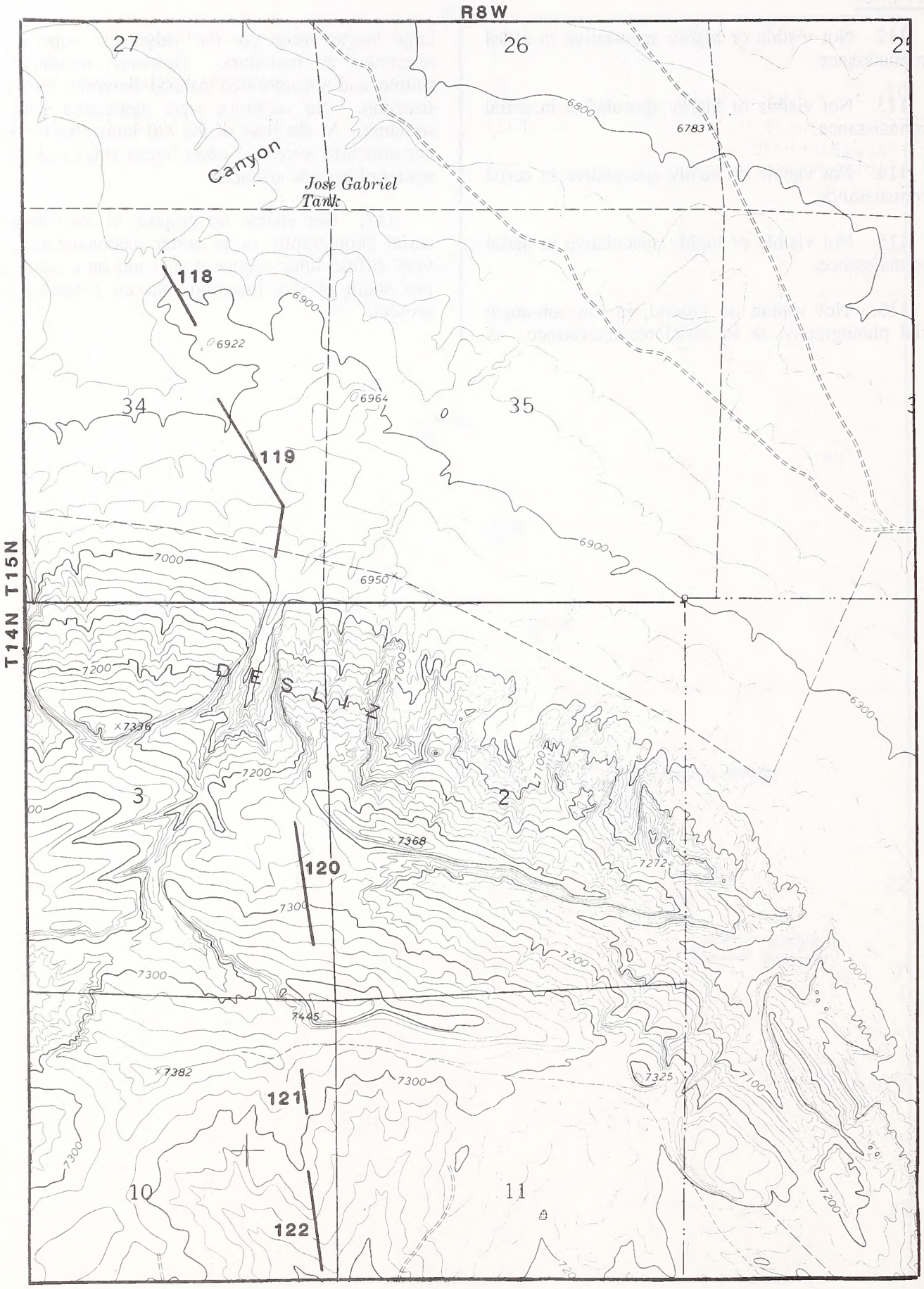
113. Not visible or highly speculative in aerial reconnaissance.

114. Not visible or highly speculative in aerial reconnaissance.

115. Not visible or highly speculative in aerial reconnaissance.

116. Not visible on ground, in low-sun-angle aerial photography, or in aerial reconnaissance. A large hogan ring on the ridgecrest superficially resembled an herradura. However, masonry was simple and incorporated natural outcrops into construction. No ceramics were associated with the structure. At the base of the hill immediately below this structure were two other hogan rings and a light scatter of historic artifacts.

117. Not visible on ground, in low-sun-angle aerial photography or in aerial reconnaissance. A very diffuse lithic scatter was found on a sand dune just south of this lineation, but no ceramics were present.


R8W
T14N T15N
27
26
Canyon
Jose Gabriel
Tank
6800
6783
118
6900
6922
34
6964
35
119
7000
6950
6900
7200
D E S L I Z
7336
7200
3
2
7100
7368
7272
120
7300
7200
7300
7445
7382
7325
7100
121
7300
7000
10
11
122
7200

MAP 31

MAP 31

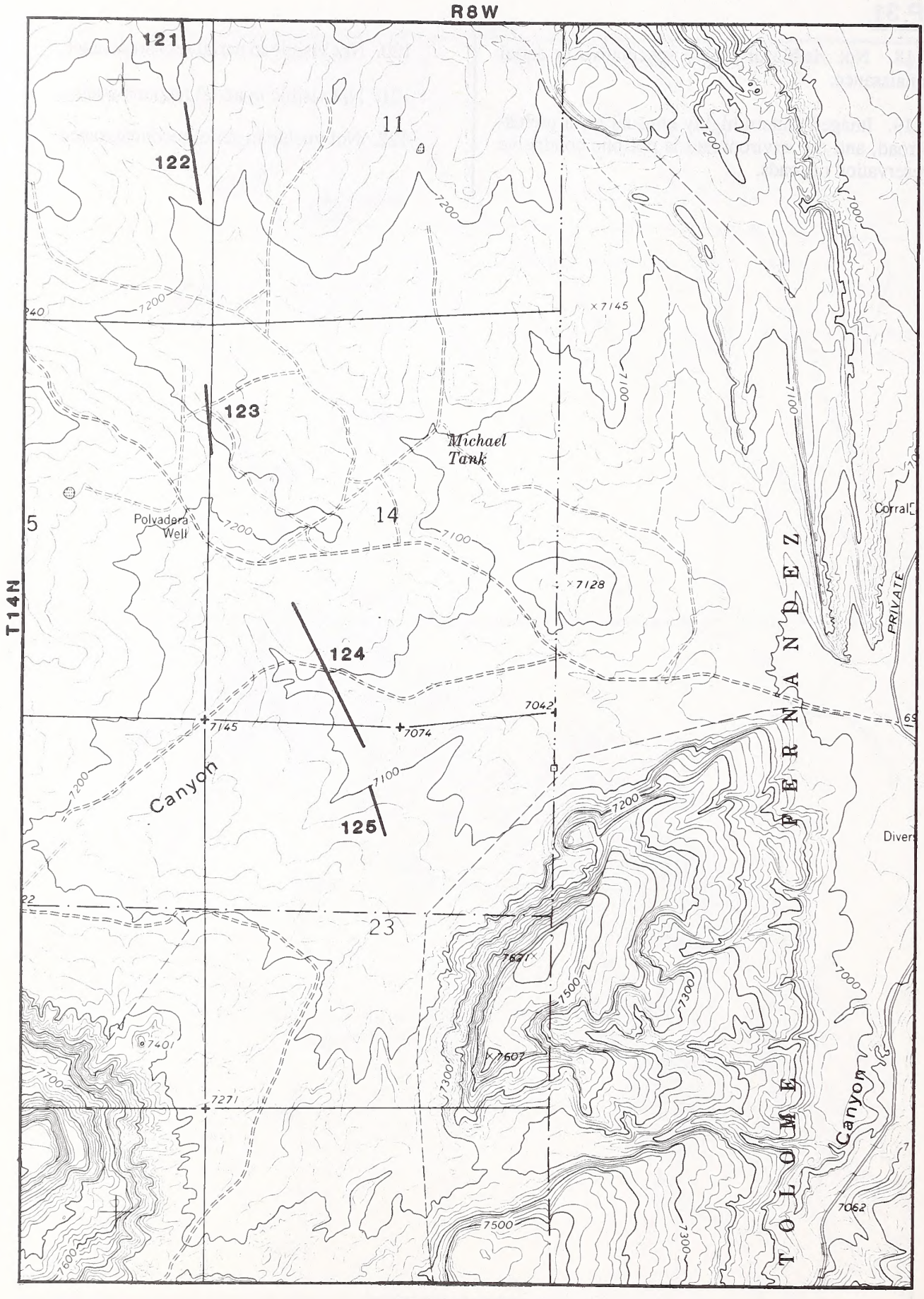
118. Not visible or highly speculative in aerial reconnaissance.

119. Imaged pattern highly unusual for a prehistoric road, and the environment is not one conducive to preservation of roads.

120. Not visible in aerial reconnaissance.

121. Not visible in aerial reconnaissance.

122. Not visible in aerial reconnaissance.


R8W
T14N
121
122
123
124
125
11
14
5
23
Michael Tank
Polvadera Well
Canyon
Canyon
PRIVATE
Corral
Diver
7200
7100
7000
7300
7500
7600
7145
7074
7042
7128
7271
7607
7401
7062
T O L M E F E R N A N D E Z

MAP 32

MAP 32

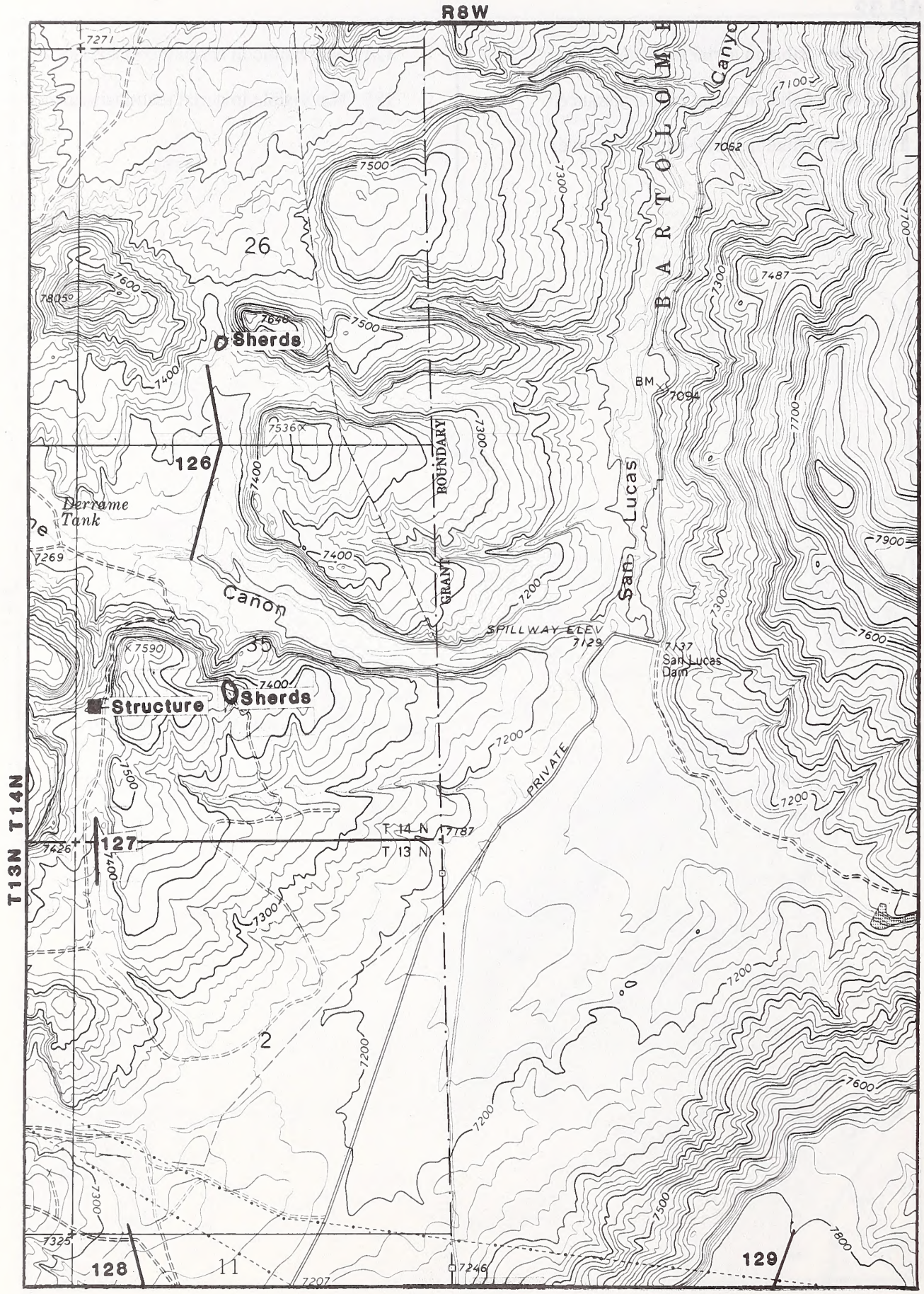
121. Not visible in aerial reconnaissance.

122. Not visible in aerial reconnaissance.

123. Not visible in aerial reconnaissance.

124. Not visible in aerial reconnaissance.

125. Not visible in aerial reconnaissance.


R8W
T13N T14N
26
35
2
11
126
127
128
129
Sherds
Sherds
Structure
Derrame Tank
Canon
BOUNDARY
GRANT
San Lucas
BARTOLOME
Canyo
SPILLWAY ELEV 7129
San Lucas Dam
PRIVATE
T 14 N
T 13 N
BM 7094
7062
7487
7137
7787
7271
7805
7646
7536
7590
7269
7426
7325
7207
7246
7100
7300
7400
7500
7600
7700
7800
7900

MAP 33

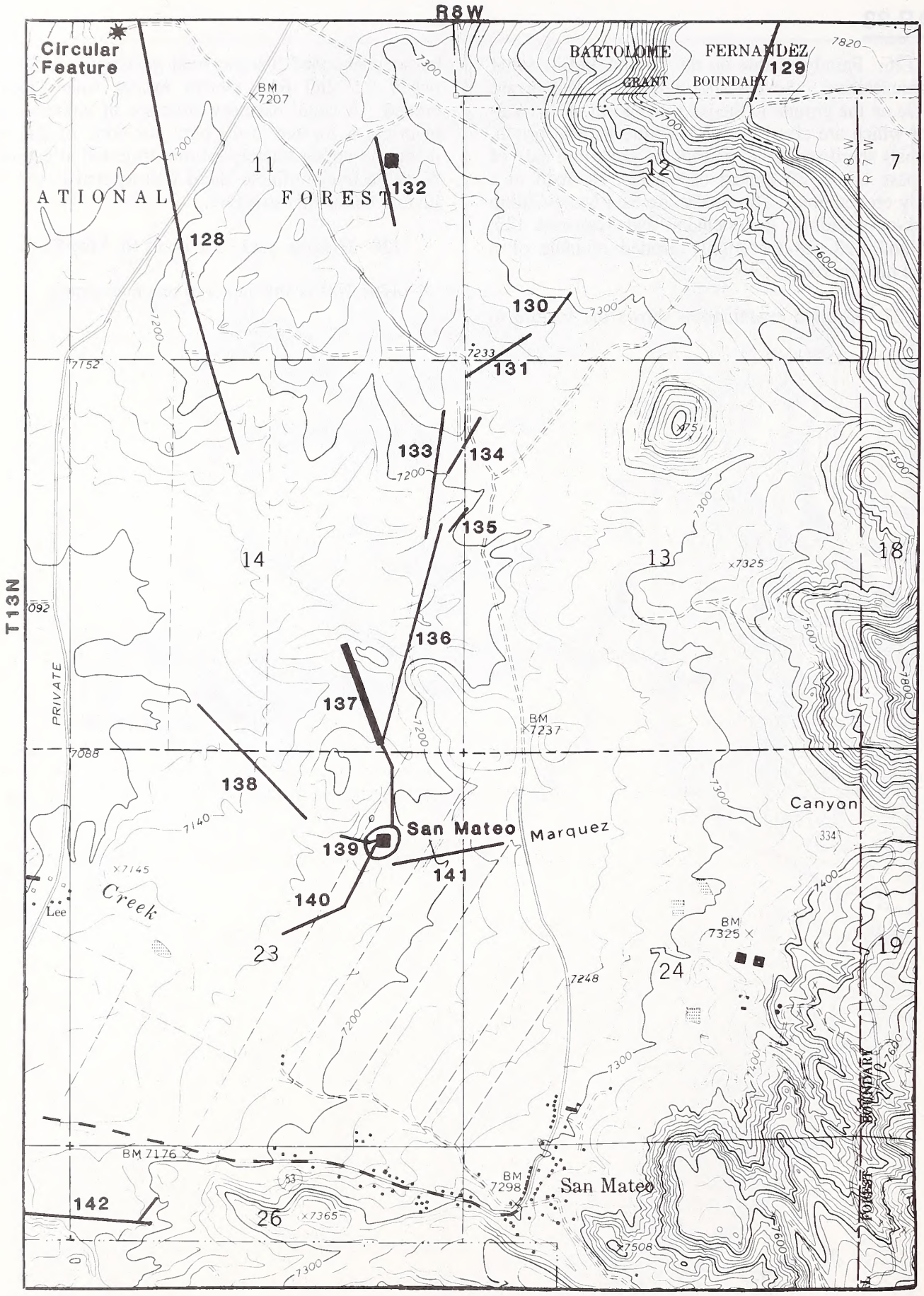
MAP 33

126. Faintly visible on the ground and in aerial reconnaissance. Several non-imaged segments are visible on the ground in the pass just north of this segment which are clearly of historic mechanical origin. A small sherd scatter is present on the south side of the pass within 30 meters of the historic road in a highly eroded area. The sherds are Red Mesa-Gallup Black-on-white. It is concluded that Segments 126, 127 and 128 are the highly eroded remains of a single historic road.

127. Ground examination shows the feature to be an abandoned historic road varying in width between 2.5 and four meters except where locally eroded. A small masonry structure of unknown age or origin is located in the pass just north of this segment and approximately on the projected alignment. A single unidentifiable sherd was located in the colluvium below this structure.

128. Historic road. See notes for May 34.

129. Not visible in aerial reconnaissance.


R8W
Circular Feature
BARTOLOME FERNANDEZ GRANT BOUNDARY
129
BM 7207
11
12
7
R8W
R7W
ATIONAL FOREST
132
128
130
131
7152
7233
133
134
135
14
13
18
T13N
092
PRIVATE
136
137
BM 7237
7088
138
San Mateo
Marquez
Canyon
139
141
140
Lee
Creek
23
24
19
BM 7325
7248
BM 7176
BM 7298
San Mateo
142
26
BOUNDARY
FOREST

MAP 34

MAP 34

128. Some portions not visible on ground. Ground examination and aerial reconnaissance show historic characteristics. Visible portions suggest highly eroded historic road, usually deep, varying in width from three to seven meters. Ruts visible in some locations. Notable absence of prehistoric artifacts. There is no evidence to suggest historic reuse of a prehistoric road. The circular feature approximately 20 meters west of the northern terminus of this segment resembles an excavated kiva, but is of historic origin. Historic portion is in sandy aeolian and colluvial deposits.

129. Not visible in aerial reconnaissance.

130. Not visible on ground or in aerial reconnaissance.

131. Not visible on ground or in aerial reconnaissance.

132. Not visible on ground or in aerial reconnaissance. A small roomblock is located on the lineation. Limited ceramics in the vicinity of the site are Gallup Black-on-white.

133. Not visible on ground or in aerial reconnaissance.

134. Not visible on ground or in aerial reconnaissance.

135. Not visible on ground or in aerial reconnaissance.

136. Ground observation reveals that the southern portion was destroyed by modern road construction, northern portion not visible on ground or in aerial reconnaissance.

137. This feature exhibits photocharacteristics of a prehistoric road. Ground observation at the northern end of this lineation confirms prehistoric origin. The feature is visible as a shallow swale 8.5 meters in width, bounded on both east and west sides by a low stoney berm or stone concentration. Ceramics were in both direct and proximity association.

138. Not visible in aerial reconnaissance.

139. Not visible in aerial reconnaissance.

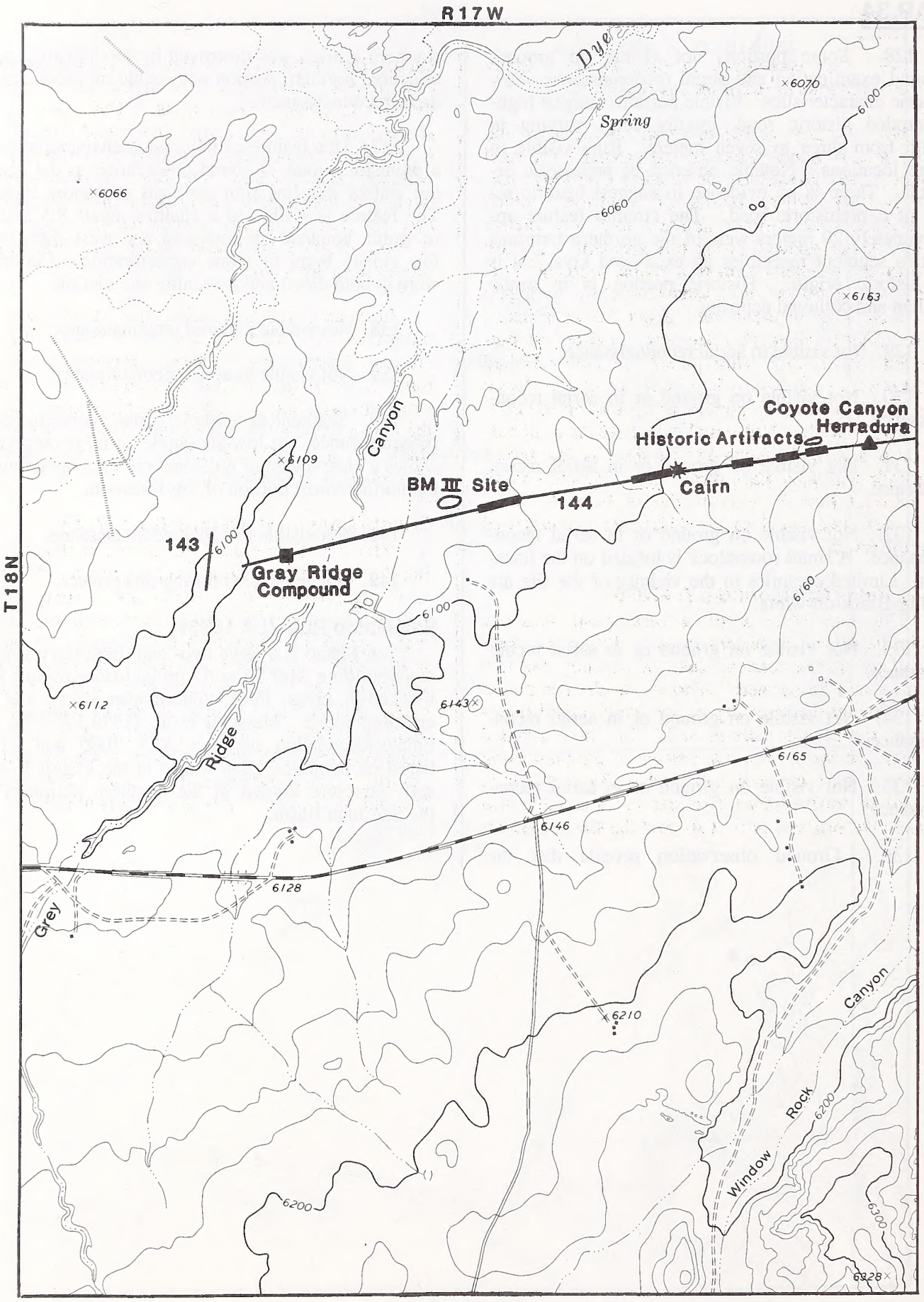
140. Segment as a whole is not visible in aerial reconnaissance, but low-sun-angle aerial photography shows a clear swale or erosional cut corresponding to the northernmost portion of this lineation.

141. Not visible in aerial reconnaissance.

142. Not considered during this project.

San Mateo Ruin (LA 15369)

San Mateo is a large two- and three-story Bonito style building with 50 to 67 ground-floor rooms, two blocked-in kivas, three subterranean kivas, and an enclosed plaza. Marshall et al. (1979:195-198) estimate occupation between A.D. 1000 and 1125, based on ceramics. San Mateo is the largest Bonito style structure known in the southern periphery of the San Juan Basin.


R17W
T18N
Dye
Spring
Canyon
Coyote Canyon
Herradura
Historic Artifacts
Cairn
BM III Site
144
143
Gray Ridge
Compound
Ridge
Grey
Canyon
Rock
Window
6100
6060
6070
6066
6109
6112
6143
6160
6165
6146
6128
6210
6200
6300
6328
6163

MAP 35

MAP 35

143. Not considered in this project. Many Anasazi roomblocks occur on this ridge.

144. Clearly visible in aerial photography and easily seen in many places on the ground. The road is particularly ground-visible in areas overlying shallow bedrock where berms of sandstone rubble derived from the bedrock define a road nine meters wide. About midway along this segment is a cairn built on the southern berm of a visible segment. It is composed of 60 or more sandstone clasts in a pile two meters in diameter and about 30 centimeters high. Sherds along this segment consisted of corrugated and black-on-white pottery, including Gallup and Escavada Black-on-white. One sherd of redware was noted. Plain gray pottery was found on the eastern margin of Grey Ridge Valley, where the road passes near a small Basketmaker III site. A few pieces of purple and aqua glass were found 20 meters north of the road, near the eastern edge of Map 35. They were near two small cairns which are presumed of historic origin.

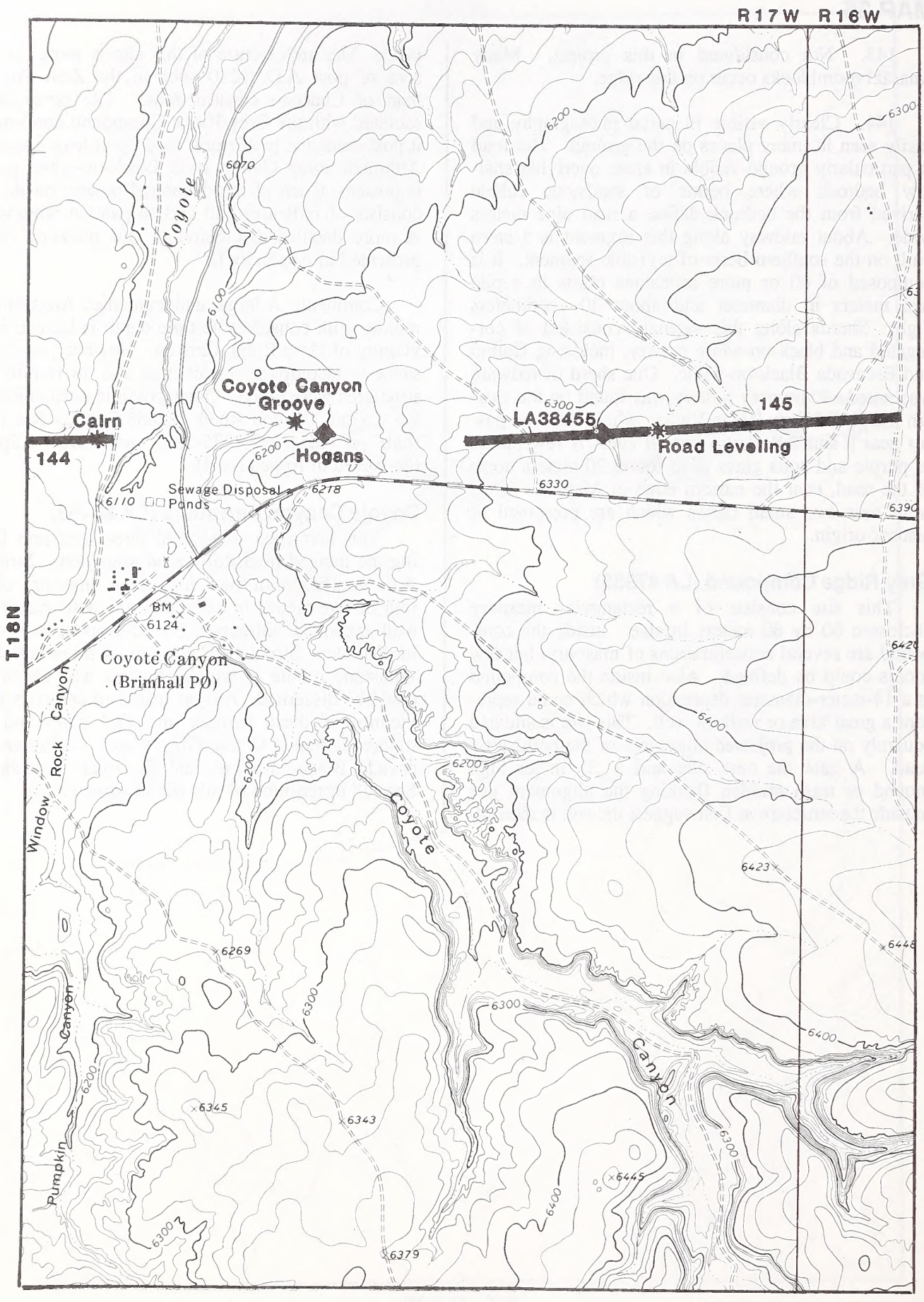
Grey Ridge Compound (LA 47856)

This site consists of a rectangular masonry enclosure 60 by 60 meters in size. Inside the compound are several concentrations of masonry, but few rooms could be defined. Also inside the compound is a 14-meter-diameter depression which could represent a great kiva or walk-in well. This site is situated squarely on the projected alignment of the prehistoric road. A gate the east side and a .35 meter high mound or trash midden flanking the alignment just outside the structure at first suggest the site is road-related. The architecture of this site is more reminiscent of post A.D. 1250 sites in the Zuni Province than of Chacoan constructions. The ceramics associated with the Grey Ridge Compound confirm that it post-dates the prehistoric road by at least a century. Although some Gallup style Black-on-white pottery is present, much of the decorated pottery on this site consists of redwares and carbon-painted whitewares. A more detailed discussion of this puzzling ruin is presented in Appendix II.

Comment: A large, undocumented Anasazi community with considerable time depth is located in the vicinity of Grey Ridge Canyon. However, reconnaissance is incomplete in this area and no Bonito style structures were noted. Other possible destinations for the Coyote Canyon Road include Toh La Kai (Marshall et al. 1979:235-237) and Deer Springs (described in Appendix II).

Coyote Canyon Herradura (LA 38453)

This herradura consists of three structures flanking the imaged prehistoric road alignment. Structure A is composed of two contiguous masonry circles four or five meters in diameter, with a six-meter-long wall appended. Structure B is C-shaped, five meters in diameter. Structure C consists of a low mound of sandstone rubble in which no clear wall alignments could be discerned. A light scatter of ceramics in the vicinity of these features included plain and corrugated indented Cibola Gray Wares, Gallup and Escavada Black-on-white, and St. Johns Polychrome. See full description of this site in Appendix II.


R17W R16W
T18N
Coyote
Coyote Canyon
Groove
Cairn
144
145
LA38455
Road Leveling
Hogans
Sewage Disposal
Ponds
6110
6218
6330
6390
BM
6124
Coyote Canyon
(Brimhall PO)
Window Rock Canyon
Coyote
Canyon
Pumpkin Canyon
6070
6100
6200
6300
6400
6269
6345
6343
6445
6379
6423

MAP 36

MAP 36

144. Visible in aerial photography and on the ground. The surface expression in this area consists of displaced sandstone substrate forming rubble berms. Near the eastern end of this segment is a small feature which appears to be a collapsed cairn. Situated on the southern berm, it consists of 15 to 20 sandstone slabs concentrated in an area one meter by 1.75 meters in size.

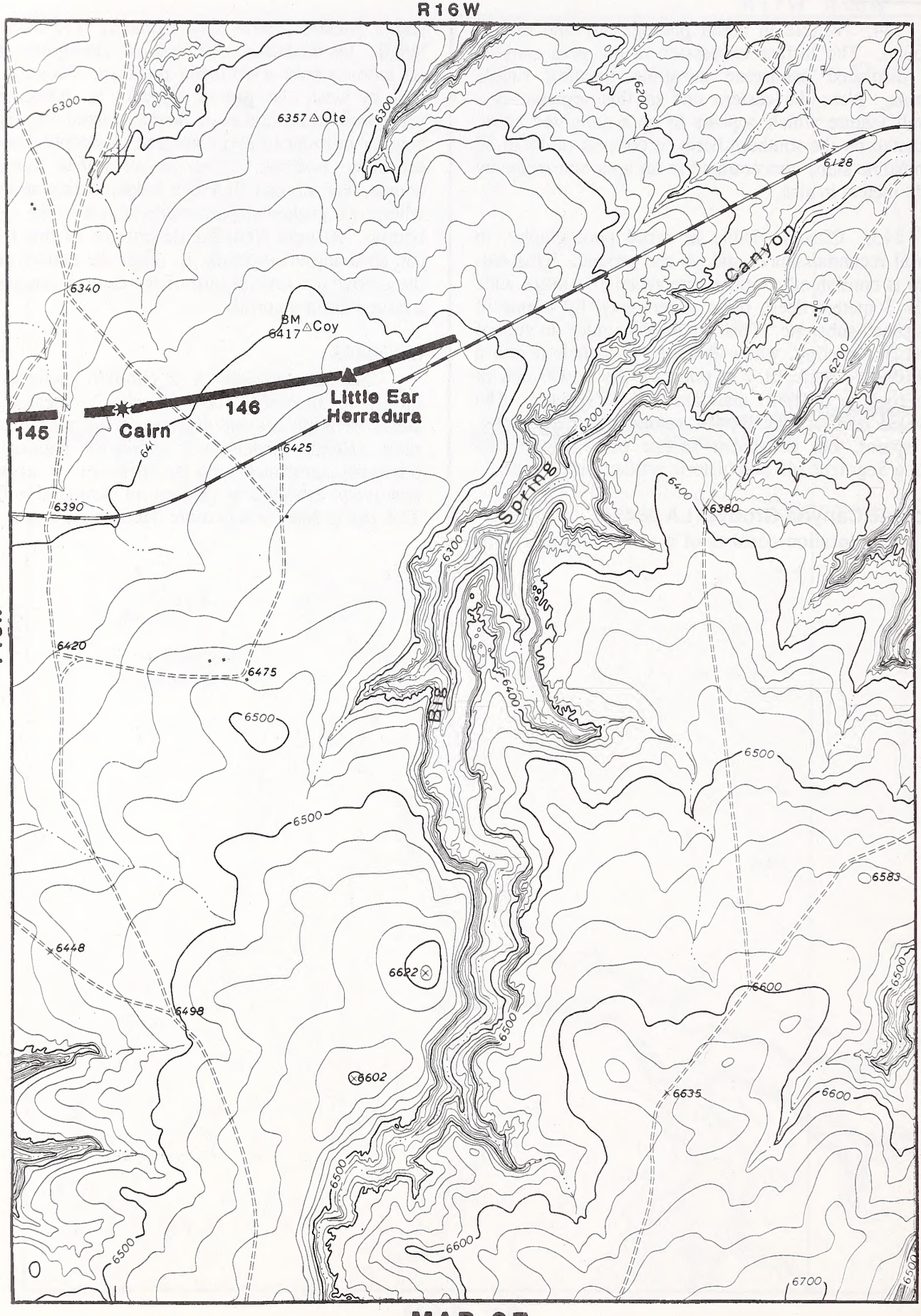
145. Clearly visible in aerial photography, in aerial reconnaissance, and on the ground. This feature is consistently visible as a swale 10 meters wide and .3 meters deep, often accentuated by berms of disturbed substrate. This segment included an area of massive leveling, where the road was incised into a sideslope. Backdirt was piled on the downslope of the road in order to maintain a level surface. The leveled portion was approximately 100 meters long. A sparse, but consistent scatter of sherds occurs along Segment 145 and historic artifacts are absent.

Coyote Canyon Groove (LA 38454)

This location consists of a set of masonry steps and a pecked groove approximately 330 meters in length. On its eastern end there are clearly two parallel grooves over a 40-meter distance. Moving from east to west, the groove appears to delineate the prehistoric roadway as it deviates from its original bearing in order to avoid an area of steeply dissected sandstone bedrock. The groove traces a sinuous course over a broad slickrock ledge, ending at a point where two pecked steps provide access to the canyon bottom. A more complete description of this feature can be found in Appendix II. Near the eastern end of the groove are several turn-of-the-century hogans and a large masonry corral.

LA 38445

This site consists of a circular enclosure 3.5 meters in diameter. This structure is located on a slickrock exposure on the margin of a shallow arroyo. Neither historic nor prehistoric material was obviously associated with the structure. It cannot be positively assigned a cultural or temporal affinity. This site is described in more detail in Appendix II.


R16W
T18N
6357 △ Ote
BM 6417 △ Coy
145
146
Cairn
Little Ear Herradura
Canyon
Spring
Big
6300
6200
6340
6390
6425
6420
6475
6500
6400
6380
6448
6498
6622
6602
6583
6600
6635
6700

MAP 37

MAP 37

145. See notes for Map 36.

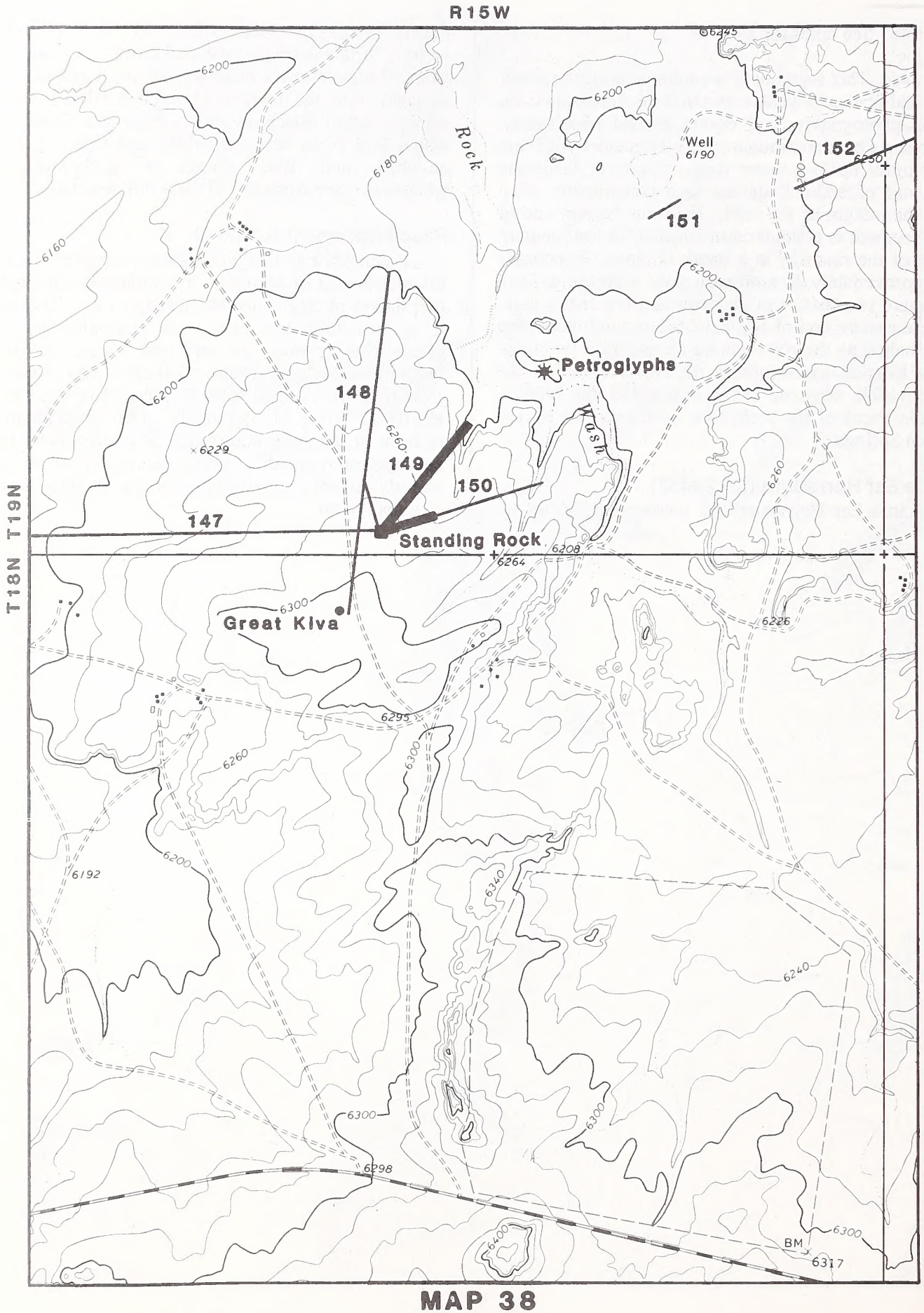
146. This segment is a continuation of Segment 145 and is clearly visible in aerial reconnaissance, on aerial photography, and during ground observation. It consists of a continuous swale 10 meters wide and sometimes up to a meter deep. Clasts of sandstone torn out of bedrock during road construction often line the margin of the road. Near the western end of this segment is a small cairn situated on the southern edge of the roadway at a break in slope. It consists of approximately 20 sandstone slabs arranged to form a feature two meters in diameter and one meter high. At the eastern end of Segment 146 ground inspection was halted as the road neared an occupied dwelling. This location approximates the western end of the photovisible segment, but it is possible that ground-visible traces of the prehistoric road continue toward Peach Springs.

Little Ear Herradura (LA 38457)

Little Ear Herradura is a masonry arc about six meters across its open edge. In the immediate vicinity of this herradura the prehistoric road narrows from 10 meters to six meters in width. Ceramics associated with the herradura included Cibola plainwares, Gallup Black-on-white, Escavada Black-on-white, Red Mesa Black-on-white, and Chaco Black-on-white and four sherds of carbon-painted whiteware. See Appendix II for a full description.

Peach Springs (LA 10770)

Peach Springs is a great house located about 1.6 kilometers east of Map 37. It is almost certainly the destination of Segments 144 through 146. This site is a two-story structure with approximately 20 ground-floor rooms, an enclosed plaza, and one blocked-in kiva (Powers, Gillespie and Lekson 1983:67-72). A great kiva is adjacent to the structure (Marshall et al. 1979:307). Two large mounds in front of the great house may be earthworks. The southeastern mound in particular tapers off in an easterly direction, gradually assuming the appearance of a road berm.


R15W
T18N T19N
Rock
Wash
Well
6190
Petroglyphs
Standing Rock
6264
Great Kiva
147
148
149
150
151
152
6200
6180
6160
6229
6260
6208
6300
6295
6192
6340
6240
6298
6400
BM
6317
6226
6245

MAP 38

MAP 38

147. Photo interpreted only. This segment is not obvious on the ground, but no intensive ground search was made.

148. Photo interpreted only. This segment is not obvious on the ground, but no intensive ground search was made.

149. Clearly visible on aerial photography and on the ground. This feature is a 10- to 11-meter-wide swale flanked on both sides by massive earthworks. It is visible until it drops into alluvial bottomland along Standing Rock Wash. The eastern earthwork along this segment has a much higher organic content than the western earthwork. Near the northern end of the western earthwork is a slab box or hearth.

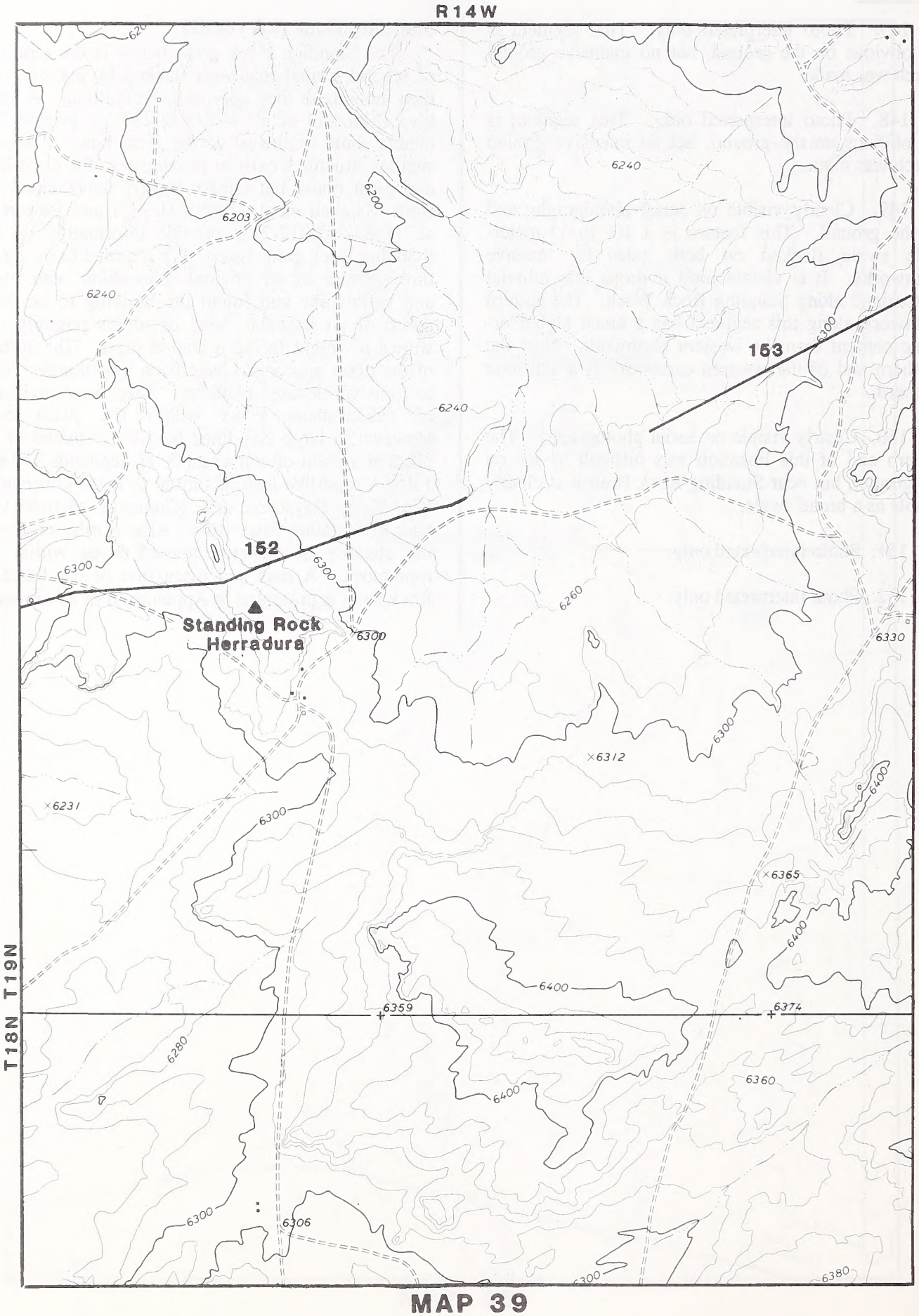
150. Clearly visible on aerial photography. The eastern end of this lineation was difficult to see on the ground, but near Standing Rock Ruin it is clearly visible as a broad swale.

151. Photo interpreted only.

152. Photo interpreted only.

Standing Rock (LA 18232)

The Standing Rock great house is the terminus of several formal roadways flanked by massive earthen mounds as they approach the building. A great kiva (Marshall et al. 1979:232-233) is located 300 meters south-southwest of the great house. Several smaller structures exist in proximity to the great kiva and great house but remain largely undocumented. Both Marshall et al. (1979:231-233) and Powers et al. (1983:207,212-213) provide information on the Standing Rock great house. We returned to the structure because of its obvious association with roads and earthworks and found the building to be composed of an irregular "arc" of rooms possibly two stories in height facing a walled plaza. The surface of the plaza appears to have been intentionally filled to form an elevated platform. There is no evidence of subterranean kivas within the plaza area. However, a large slab-lined hearth is situated in the plaza at a point of convergence of Segments 149 and 150. A road-like feature similar to those observed at Kin Ya'a, Haystack, and Manuelito encircles the base of Standing Rock Ruin. Also worthy of note is the absence of elevated housed kivas within the roomblock. A map and discussion of the Standing Rock Ruin is presented in Appendix II of this report.


R14W
T18N T19N
153
152
Standing Rock
Herradura
6240
6203
6200
6300
6260
6330
×6312
6400
×6365
×6231
6359
6374
6280
6360
6306
6380

MAP 39

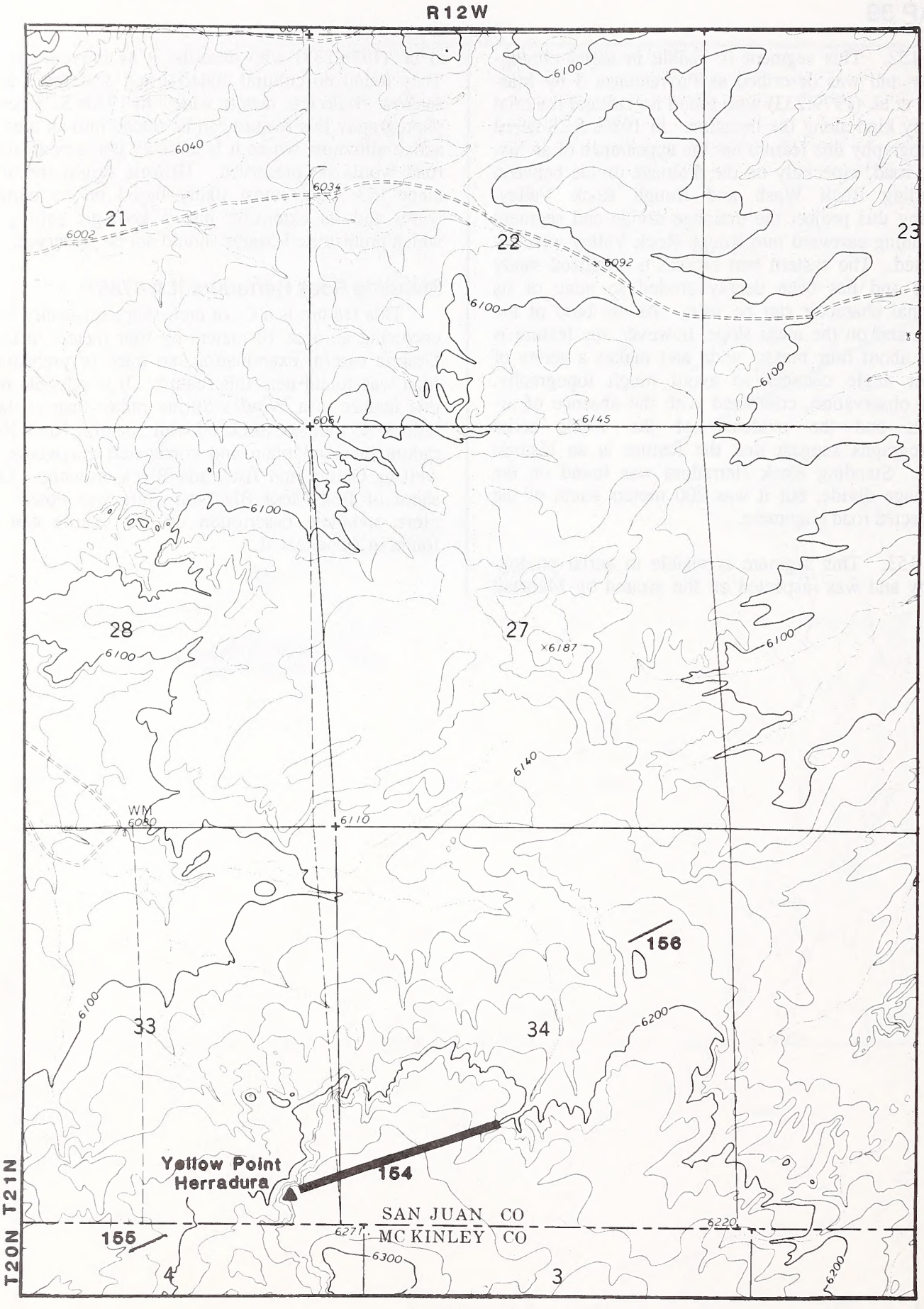
MAP 39

152. This segment is visible in aerial photography and was described as Provenience 3 by Marshall et al. (1979:233) who found no cultural material of any kind along the lineation. In 1930s SCS aerial photography this feature has the appearance of an historic road, especially on the drainage divide between Standing Rock Wash and Rough Rock Valley. During this project the drainage divide and segment extending eastward into Rough Rock Valley were inspected. The eastern part crosses a stabilized sandy slope and has been deeply eroded so none of its original character can be seen. At the base of the mesa and on the mesa slope, however, the feature is only about four meters wide and makes a series of minor angle changes to avoid rough topography. This observation, combined with the absence of artifacts and the evidence of the 1930s aerial photographs suggest that the feature is an historic road. Standing Rock Herradura was found on the drainage divide, but it was 200 meters south of the suspected road alignment.

153. This segment is visible in aerial photography and was inspected on the ground by Marshall et al. (1979:233) who describe it as Provenience 4. They found no cultural material and describe it as a shallow swale five meters wide. In 1930s SCS aerial photography this feature can be traced into an area of active alluvium, where it is unlikely that a prehistoric road would be preserved. Historic origin for Segment 153 seems most likely based on its narrow width and its extension into a geologic setting in which prehistoric features should not be preserved.

Standing Rock Herradura (LA 47857)

This feature is a C- or arch-shaped masonry wall enclosing an area 10 meters by four meters in size. Despite careful examination, no trace of prehistoric road was found near this feature. It is possible that this feature is a Windes Shrine rather than an herradura. Ceramics associated with Standing Rock Herradura included plain and corrugated graywares, as well as Gallup and Escavada Black-on-white. One sherd of Red Mesa Black-on-white was noted. A more complete description of this feature can be found in Appendix II.


R12W
T20N T21N
21
22
23
28
27
33
34
4
3
6100
6040
6034
6002
6092
6061
6145
6187
6140
6110
WM
6050
6200
6220
6300
6277
156
154
155
Yellow Point
Herradura
SAN JUAN CO
MC KINLEY CO

MAP 40

MAP 40

154. This segment has not been inspected on the ground. However, it is clearly visible on both aerial photography and in aerial reconnaissance. These observations, along with the association of this segment with the Yellow Point Herradura, leave little doubt that Segment 154 is of prehistoric origin.

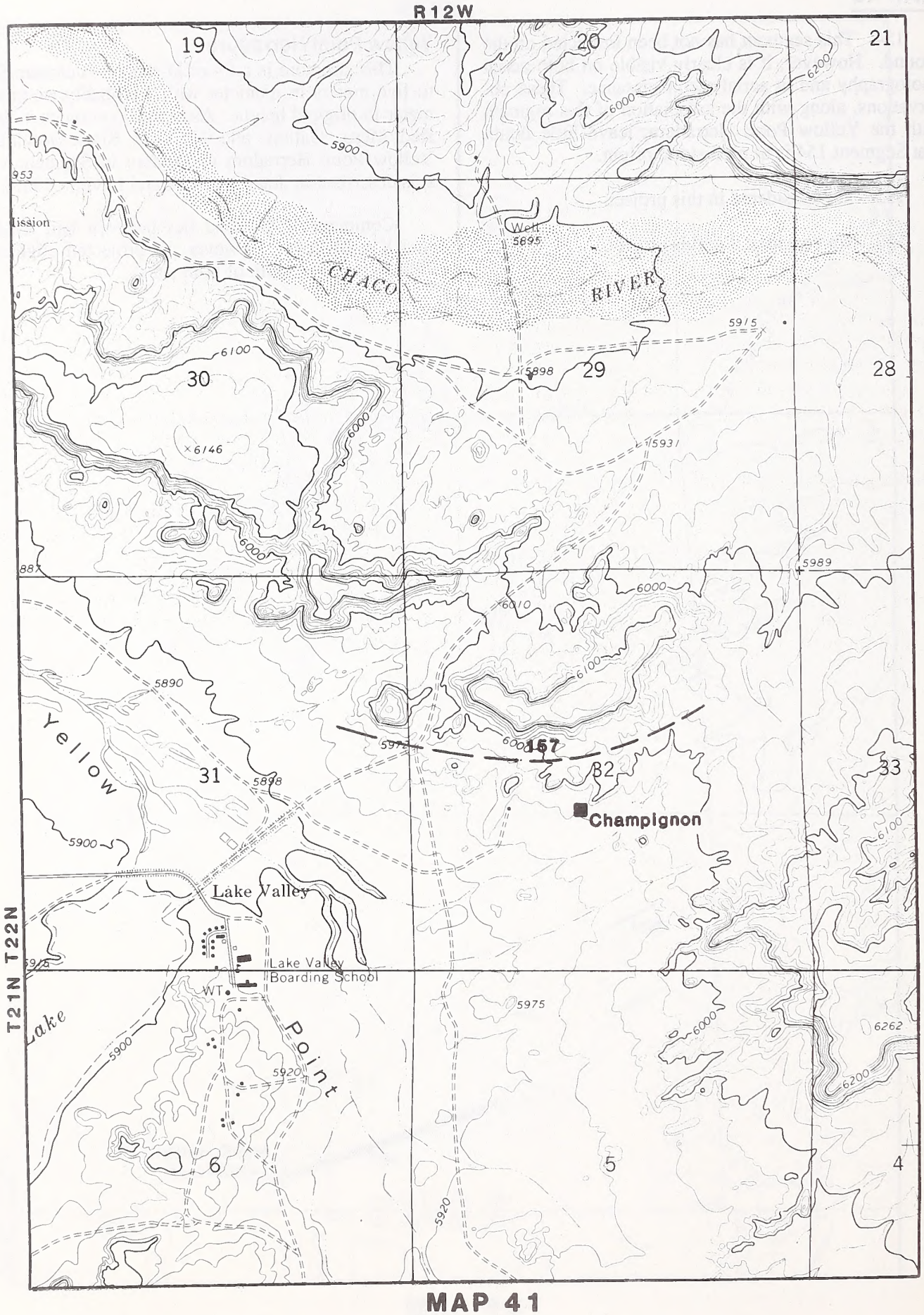
155. Not considered in this project.

156. Not considered in this project.

Yellow Point Herradura

This structure is a C- or D-shaped enclosure four to five meters in diameter which probably stood one meter in original height. Associated ceramics include Red Mesa, Gallup, and McElmo Black-on-white. Yellow Point Herradura is adjacent to Segment 154. It is described in detail by Stein and Levine (1983).

Comment: This road lies between Kin Klizhin and Kin Bineola. However, its projected alignment falls to well the south of both sites.


R12W
T21N T22N
19
20
21
30
29
28
31
32
33
6
5
4
CHACO
RIVER
Well
5895
5915
5898
5931
5989
6146
6100
6000
6010
6200
5890
5900
5920
5975
6262
Yellow
Lake
Point
Lake Valley
Lake Valley
Boarding School
WT
Champignon
157
953
887
915

MAP 41

MAP 41

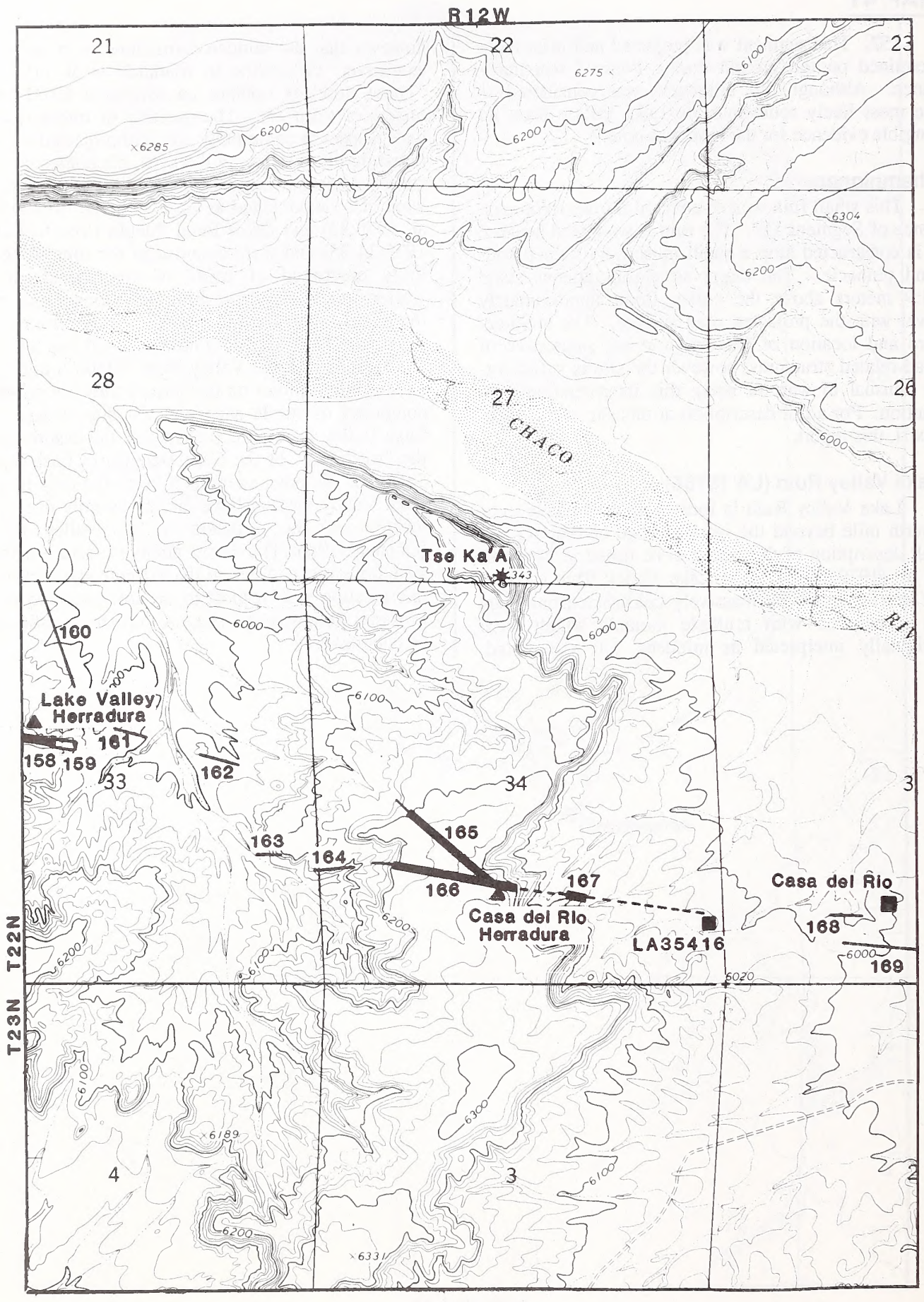
157. This segment was projected and informally examined on the ground during Phase I reconnaissance. Although this alignment was considered as the most likely route into the Lake Valley Ruin no tangible evidence for the road was noted.

Champignon

This small ruin was discovered during reconnaissance of Segment 159. The ruin is so named because it is constructed atop a small mushroom-shaped badland pinnacle. The major structural remains stand 11.9 meters above the valley floor, approximately level with the projected road surface. The architecture and location of Champignon are suggestive of road-related structures, however the site is sufficiently unusual to warrant using this interpretation with caution. For a full description of this site, see Appendix II, this report.

Lake Valley Ruin (LA 18755)

Lake Valley Ruin is located approximately one-fourth mile beyond the western edge of Map 41. A full description of this ruin can be found in Marshall et al. (1979:73-75). The Lake Valley Ruin consists of several small but massively constructed buildings in association with multiple mounds which were originally interpreted as middens. It was noted, however that the midden formations were unusually extensive. According to Marshall et al. (1979:75) "These middens contain an estimated 9,031 cubic meters of trash fill. The quantity of midden debris with respect to community size and projected occupational duration is, to say the least, phenomenal." Because disproportionately massive midden/mounds were also documented at Casa Del Rio (Marshall et al. 1979:32) and Great Bend Pueblo (Marshall et al. 1979:34-35) and were assumed at the time to be entirely composed of trash, it was speculated the western roads may have been used longer and more intensively than the other known road systems (see Robertson 1981:65). It is now believed that although the mounds at Lake Valley Ruin exhibit a high density of cultural litter on the surface they are primarily composed of sterile sand and red dog shales. The Lake Valley location is presumably the destination of the "west fork" of the Casa Del Rio to Lake Valley Segment. To date, attempts to trace the road into the Lake Valley vicinity have failed, possibly due to the location of the structure in the valley bottom (Obenauf 1980:71). These attempts were not intensive, however, and due to the extreme significance of this location with respect to the interpretation of the Western Roadway we suggest further investigations be undertaken.


R12W
21
22
23
28
27
26
CHACO
Tse Ka'A
160
Lake Valley
Herradura
161
158
159
33
162
34
163
164
165
166
167
Casa del Rio
Herradura
LA35416
Casa del Rio
168
169
T23N
T22N
4
3
6285
6275
6304
6189
6331
6020

MAP 42

MAP 42

158. This segment was not located on aerial imagery but is clearly visible from the ground perspective as a shallow swale seven meters in width bearing N280° which passes south of and articulates with the Lake Valley Herradura. The swale is visible to approximately 100 meters east of the herradura but becomes incised by erosion and is quickly lost to the west of the structure. For material samples from the road surface see Stein and Levine (1983:C17-19).

159. At a point approximately 100 meters N100° from the Lake Valley Herradura the road alignment traverses a stretch of slickrock, on which a dense scatter of ceramics appears to be concentrated within the alignment. A sherd count from this area is presented as Sample No. 3 in the description of the Lake Valley Herradura (Stein and Levine 1983:C17-19).

160. This segment was visited during the reconnaissance aspect of Phase I. It could not be ground verified at that time.

161. This segment was visited during the reconnaissance aspect of Phase I. The segment could not be located on the ground at that time.

162. This segment was visited during the reconnaissance aspect of Phase I and could not be ground verified at that time. A Pueblo I roomblock of five rooms evidenced by upright slabs was noted north of the imaged alignment. A slab-lined hearth associated with this structure was initially identified as a possible road feature, however ceramic associations were clearly early.

163. No information.

164. No information.

165. This segment is clearly visible from both an aerial and ground perspective. It is described as the "Northwest Branch" of the Casa Del Rio to Lake Valley Roadway (Stein and Levine 1983:C15-17), and is illustrated as the "Northwest Fork" in Kincaid, Stein and Levine (1983:9-15). Segment 165 is ground-visible for approximately 400 meters as a swale roughly five meters in width and .35 meters in depth, traversing a mesa top with sandsage, grass and snakeweed cover. The roadway was apparently excavated through a thin sandy mantle to bedrock, resulting in a swale with a shallow parabolic cross section and little evidence of curbing or berms on the road margin.

Segment 165 diverges from Segment 166 immediately west of the Casa del Rio Herradura at a bearing of N310°. Ground visibility of Segment 165 is considerably greater than that for Segment 166. A dense concentration of ceramics is clearly concentrated within Segment 165, particularly at the eastern end of the segment where the alignment crosses a short exposure of bedrock. A sample of the ceramics in this area is presented in Stein and Levine (1983:C16-17).

Segment 165 is clearly prehistoric in origin. Destination of this segment is not currently known.

166. Segment 166 is clearly visible from both a ground and aerial perspective for roughly 500 meters across the mesa top west of the Casa del Rio Herradura. The segment becomes visible as a shallow swale about five meters wide. At the extreme margin of the mesa it passes immediately north of the Casa del Rio Herradura, proceeding on a bearing of N280°. Although Segment 166 is slightly less visible from the ground perspective and less clearly associated with ceramic debris, it is nonetheless the most likely of the two alignments to articulate with the Lake Valley Herradura and to connect with the Lake Valley Ruin.

Comment: The intersection of Segments 165 and 166 represents the only known formalization of a road intersection at an herradura structure, thus making this a significant location in the study of Chacoan Roads. Although there is a considerable amount of historic activity in the Casa del Rio vicinity, the steepness of the slope east of the Casa del Rio Herradura would provide a serious obstacle to wagon traffic, thus precluding the possibility that either of the mesa top segments were used historically. Both segments were judged to be clearly prehistoric in origin. For an illustration of this location see Kincaid, Stein and Levine (1983:9-15).

167. This segment represents a projection of the road alignment from the Casa del Rio Ruin to the Casa del Rio Herradura. East of the Casa del Rio Herradura the mesa drops sharply approximately 65 meters down a steep clay-shale slope with no visible sign of the prehistoric alignment. At a point approximately 200 meters east of the herradura the projected alignment crosses a low ridge. Here a slight notch/swale may represent the remnants of the prehistoric road. Ceramics are abundant in the vicinity of Segment 167 but cannot be clearly associated with the projected alignment.

168. This segment was determined not to be ground-visible during the reconnaissance aspect of

the Phase I survey. Because the imaged alignment appears to be located within the "halo" of cultural debris associated with the Casa del Rio Ruin the presence of an elongated scatter could not be ascertained.

169. This segment was not ground-visible as a swale, however results of the Phase I reconnaissance suggest that an elongated scatter of ceramics may be present.

Lake Valley Herradura (LA 17222)

This structure was originally recorded by Michael Marshall in 1977 as a location along the "Chacoan West Roadway." The structure was revisited during the reconnaissance effort of Phase I of the Chaco Roads Project and is described by Stein and Levine (1983:C17-19). From the ground perspective the structure is clearly associated with a visible swale approaching from the east at a bearing of N280°.

Casa del Rio Herradura (LA 35415)

This structure is described by Stein and Levine (1983:C15-17). The Casa del Rio Herradura is unique because it is the only known herradura to be situated at the junction of two roads. This location affords a commanding view of the mouth of Chaco Canyon.

LA 35416

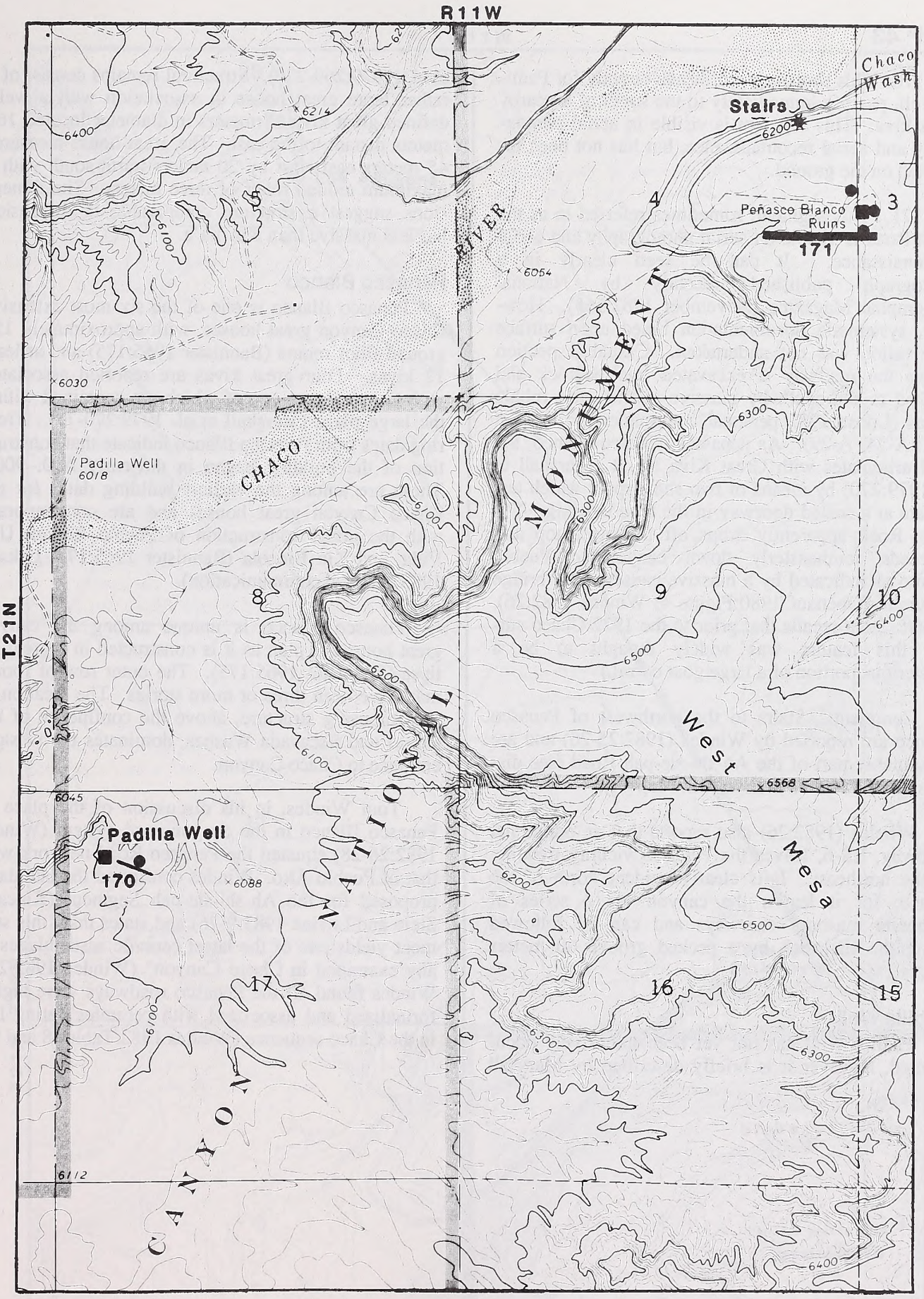
This site was recorded during the reconnaissance portion of Phase I of the Chaco Roads Project and is described by Stein and Levine (1983:C58-59). The site consists of the reduced remains of a small simple masonry room situated atop a sandstone capped badland outcrop approximately eight meters above the road alignment. Although the peculiar location of this structure suggests association with the Casa del Rio to Lake Valley Road, this association remains to be conclusively demonstrated. Structures similar to LA 35416 were recorded in the vicinity of Pierre's Ruin and are discussed by Kincaid, Stein and Levine (1983:18-20) as a class of road-associated structures termed avanzadas.

Casa del Rio (LA 17221)

Casa del Rio was discovered and described by Michael Marshall in the fall of 1977 and is fully described in Marshall et al. (1979:31-32). Casa del Rio is an enigmatic structure which, although obviously very near to if not articulated with the Western Roadway, predates the road surface and other road-related structures by as much as 100 to 125 years. The structure was reported as early Pueblo II by Marshall and described as Hosta Butte Phase (Marshall, notes Dec. 11, 1977). In fact the structure does not conform to criteria presented for great house or Bonito Phase architecture, even though the building is so massive that it was discovered during a casual perusal of aerial imagery. That the location jumped out of the image is an understatement as the building measures 45 by 84 meters and is associated with extensive middens/mounds. Marshall estimated 100 ground-floor rooms in the structure and speculated that the structure was one of a halo of large residential buildings surrounding Chaco Canyon. To date, however, no other locations similar to Casa del Rio have been located in the Chaco vicinity. Mike Marshall was the first and the last investigator to evaluate the remains at Casa del Rio. Evaluation of the date and function of the West Roadway lie with understanding the place of this structure within the Chacoan world. Further investigation of Casa del Rio is strongly recommended.

Tse Ka'a

Tse Ka'a is a sandstone-capped pinnacle which towers over 120 meters above the Chaco River. The feature can be seen as a prominent landmark from virtually all quadrants of the basin floor. From the North Road Tse Ka'a and Pretty Rock appear to stand on the north rim of the Chaco, their silhouettes each suggest a man-made edifice. Unfortunately we know very little of the significance of this natural structure to the Anasazi. The NPS crew (Powers 1981 personal communication) report that a search for shrines on the cap yielded negative results. Inquiries made by Fred York in the Lake Valley area (York 1982 personal communication) established that the local Navajo refer to the feature as Tse Ka'a (translated Arrow Rock) and, not surprisingly, regard it as baahadzid, or semi-sacred. It is a spiritually dangerous place which inspires fear and reverence. It is said to be guarded by rattlesnakes and only medicine men can visit with impunity.


R11W
T21N
Chaco Wash
Stairs
6200
Peñasco Blanco Ruins
171
4
3
5
6214
6400
6100
RIVER
6054
6030
CHACO
Padilla Well
6018
MONUMENT
6300
6100
8
9
10
6400
6500
6500
6100
West
6568
6045
Padilla Well
170
6088
NATIONAL
6200
Mesa
6500
17
16
15
6100
6300
6300
CANYON
6112
6400

MAP 43

MAP 43

170. This short segment heads directly for Padilla Well, passing immediately to the south of a nearby great kiva. This segment is visible in aerial photography and aerial reconnaissance, but has not been inspected on the ground.

171. This segment, sometimes referred to as the West Road is visible on aerial photography and aerial reconnaissance. It can be seen clearly in a photograph published recently by National Geographic Magazine (November 1982:565). However, systematic documentation based upon surface observation was not undertaken. Casual inspection shows the roadway is excavated into bedrock and flanked to the south by massive earthen and rubble berms (Loose 1982 personal communication; Vivian 1983:A-24, A-29). As it passes Penasco Blanco, the road articulates with Great Kiva No. 1 (Marshall et al. 1979:270) by means of two short spurs which terminate at a sealed doorway in the kiva housing. The West Road apparently drops off the mesa top and proceeds southeasterly down canyon to Pueblo Bonito as indicated by a massive causeway or bridge abutment (Obenauf 1980:Figure 4; Windes 1982:26). (Note: Stein recalls that prior to the 1972 Chaco survey this feature was widely thought to be a mysterious portion of a large goat corral.)

Comment: Stairs to the northwest of Penasco Blanco are reported by Windes (1982:25-26) and are presumably part of the Ah-shi-sle-pah Road (see discussion of Vivian's Stairway on Map 44).

Windes (1982:26) also reports that an additional roadway, RS-6, leaves the Penasco vicinity trending to the northeast. It is clearly evident north of the Chaco, for it leaves the canyon via a series of elaborate masonry stairways and can be followed along the slickrock by a pecked groove 60 meters long.

Padilla Well

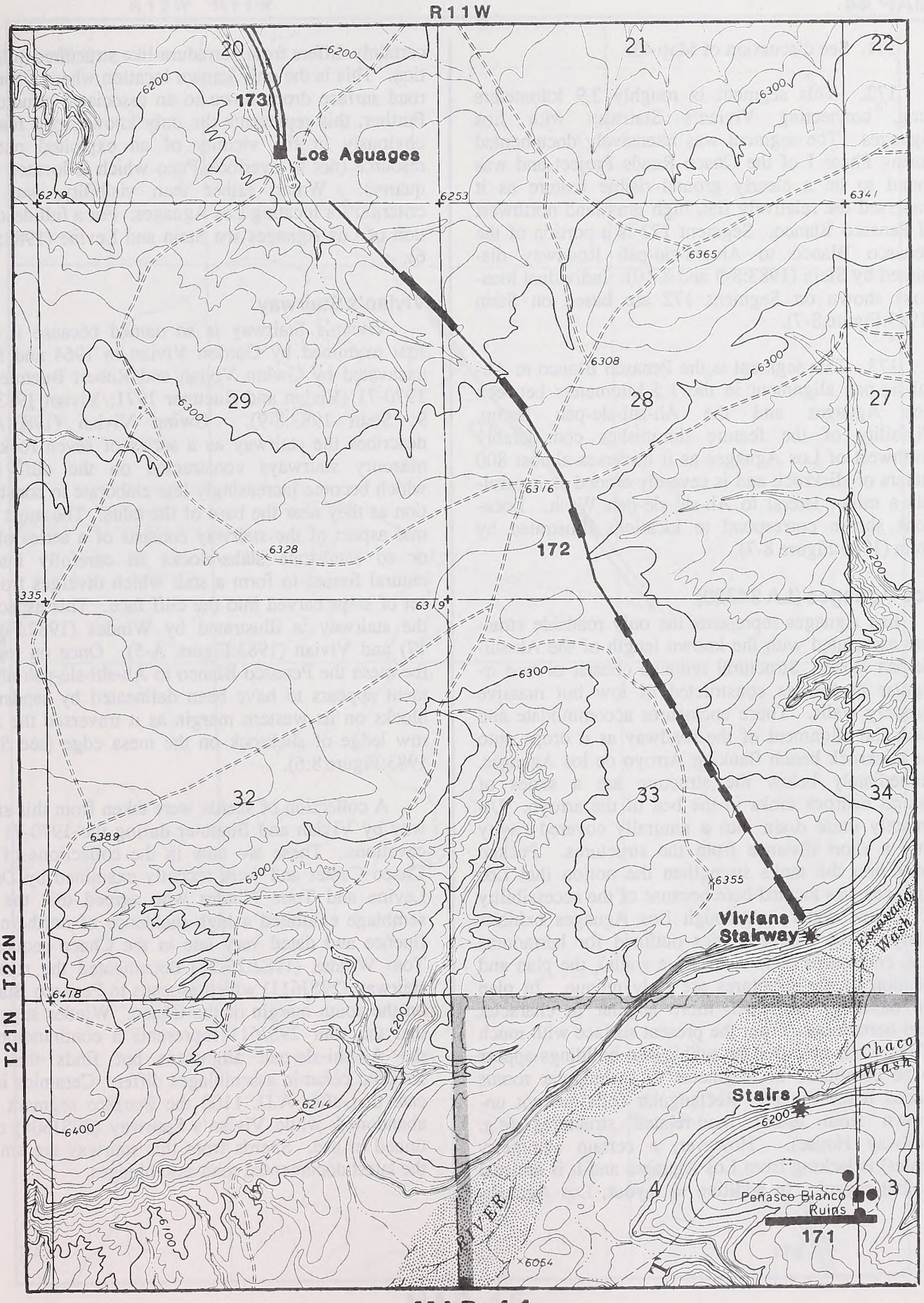
Padilla Well has not yet been intensively documented, however it is briefly described by Marshall et al. (1979:269-270). Structural remains consist of a rather large great house in association with a well-defined great kiva 17 meters in diameter located 160 meters distant to the east. The great house measures 45 meters east-west by 20 meters north-south with a maximum mound relief of three meters. Site dimensions suggest a structure comparable in dimension but less massive than Kin Ya'a.

Penasco Blanco

Penasco Blanco is one of the six most extensive Chaco Canyon great houses, with approximately 153 ground-floor rooms (Bannister 1965:175) and at least 12 kivas. Four great kivas are reported associated with the structure, two of which are contained within the large plaza (Marshall et al. 1979:270-71). Tree-ring dates from Penasco Blanco indicate that construction of the building began in the early A.D. 900s. These are among the earliest building dates for the Chaco Canyon great houses and are contemporary with the initial construction of Pueblo Bonito, Una Vida, and Kin Bineola (Bannister 1965:178; Lekson 1983 personal communication).

Penasco Blanco is unique among the canyon great houses in plan as it is constructed in a great ellipse (Bannister 1965:175). The outer row of rooms may have been three or more stories. The location of this imposing structure, above the confluence of the Chaco and Escavada Washes, dominates the western entrance to Chaco Canyon.

Tom Windes, in his discussion of the place of Penasco Blanco in the canyon road system (Windes 1982:25-28) equated the Penasco Road network with that of Pueblo Alto. Windes confirmed the late dates proposed for the Ah-shi-sle-pah Segment (Kincaid, Stein and Levine 1983:9-76) and states that "this segment yields one of the latest ceramic assemblages of any examined in Chaco Canyon" (Windes 1982:25). Windes found all the Penasco roadways were highly formalized and associated with ceramics dating late in the Chaco sequence (Windes 1982:Tables 8 and 9).


R11W
T21N T22N
20
21
22
29
28
27
32
33
34
5
4
3
173
172
171
Los Aguages
Viviane Stairway
Stairs
Peñasco Blanco Ruins
Escavado Wash
Chaco Wash
RIVER
6200
6300
6400
6253
6341
6365
6308
6316
6328
6319
6335
6389
6418
6214
6355
6054

MAP 44

171. See discussion of Map 43.

172. This segment is roughly 3.9 kilometers long, connecting Vivian's Stairway with Los Aguages. The segment was intensively documented during Phase I of the Chaco Roads Project and was found to be a clearly ground-visible feature as it traversed the relatively flat, high grassland northwest of Penasco Blanco. Segment 172 is a portion of the Penasco Blanco to Ah-shi-sle-pah Roadway discussed by Stein (1983:8-9 and 8-10). Individual locations shown on Segment 172 are based on Stein (1983:Figure 8-7).

173. This segment is the Penasco Blanco to Ah-shi-sle-pah alignment in the 1.5 kilometers between Los Aguages and the Ah-shi-sle-pah Ramp. Visibility of the feature diminishes considerably northwest of Los Aguages as it traverses almost 800 meters of slickrock and is severely eroded as it parallels a minor lateral to Ah-shi-sle-pah Wash. Locations shown correspond to locations illustrated by Stein (1983:Figure 8-7).

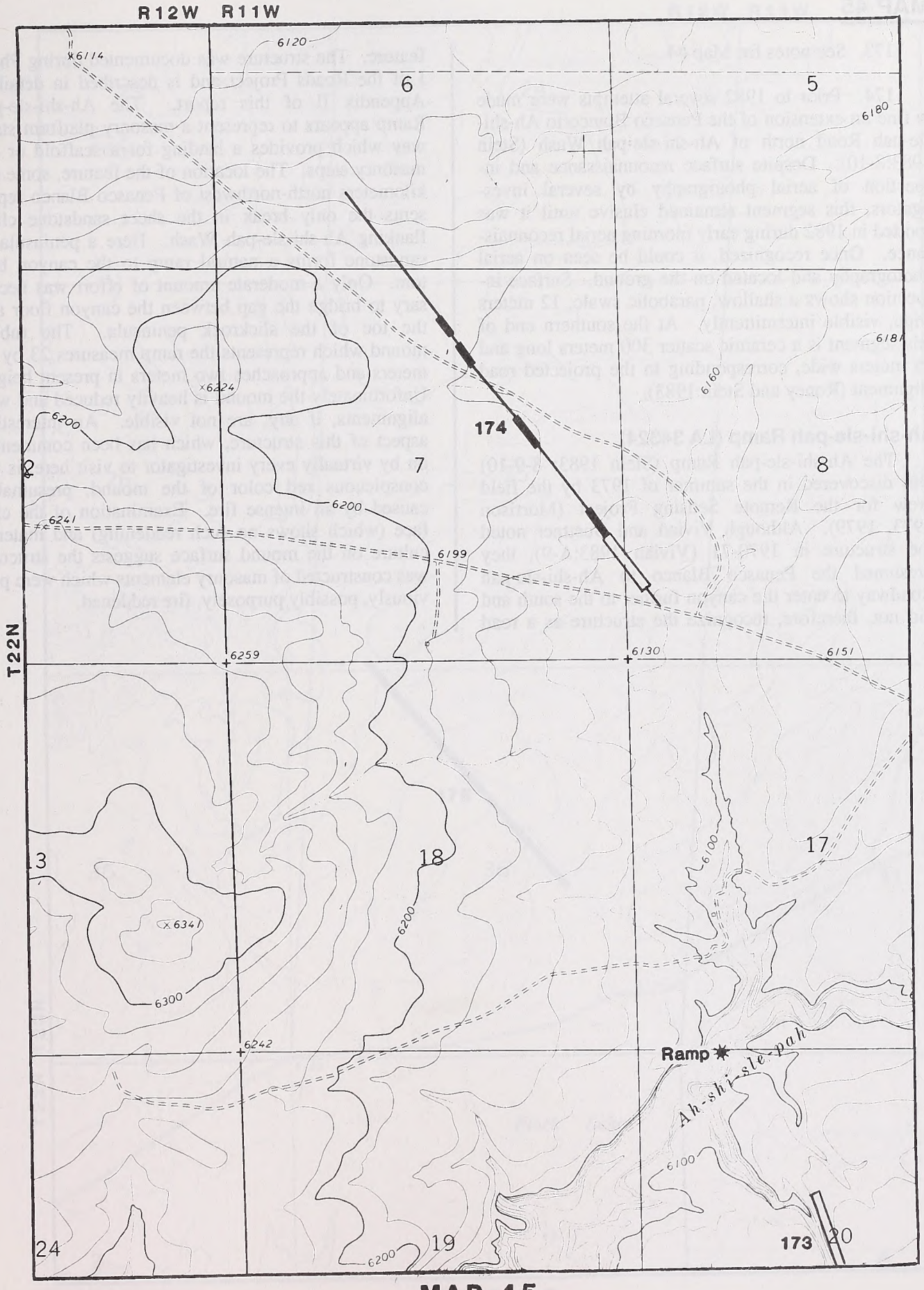
Los Aguages (LA 34320)

Los Aguages represents the only roadside structure associated with the known length of the Ah-shi-sle-pah Road. Structural remains consist of two irregular enclosures constructed of low but massive masonry walls. These enclosures accommodate and flank the alignment of the roadway as it drops onto the slickrock bench flanking Arroyo de los Aguages. Immediately below the structure are a series of natural bedrock tanks in the bed of the arroyo. Ultimately these drain into a naturally covered cavity only a short distance from the structures. Pecked steps into the tanks strengthen the notion that Los Aguages was located here because of the accessibility of surface water. Although Los Aguages exhibits many of the characteristics outlined for herraduras (e.g. enclosures of low, massive walls), the plan and location of the structures are truly unique. In plan the buildings are much more angular in character than herraduras. From the present surface with much of the walls obscured by rubble, the buildings appear to be composed of fragments of rectangular rooms placed helter-skelter. Rectangular cells are not unknown from minor road-related structures (e.g. Halfway House). However, a certain symmetry (order) is lacking from Los Aguages and it is unusual in that regard. In addition to layout, Los Aguages certainly differs from herradura-like structures in location. This is the only known location where a formal road surface drops down to an associated structure. Further, this represents the only known road feature obviously in the vicinity of an exploited natural resource (not to overlook Poco which is located in a quarry). Water, rather than visibility, was the criterion for locating Los Aguages. For a full description of Los Aguages see Stein and Levine (1983:C2-6).

Vivian's Stairway

Vivian's Stairway is so named because it was first examined by Gordon Vivian in 1964 and later excavated by Gwinn Vivian and Robert Buettner in 1970-71 (Vivian and Buettner 1971; Vivian 1983:A-9; Stein 1983:8-9). Gwinn Vivian (1983:A-9) describes the stairway as a series of seven rock-cut masonry stairways constructed on the cliff face which become increasingly less elaborate in construction as they near the base of the talus. The most formal aspect of the stairway consists of a series of 10 or so sandstone slabs/blocks fit carefully into a natural fissure to form a stair which diverges from a set of steps carved into the cliff face. This aspect of the stairway is illustrated by Windes (1982:Figure 17) and Vivian (1983:Figure A-5). Once on top of the mesa the Penasco Blanco to Ah-shi-sle-pah alignment appears to have been delineated by sandstone blocks on its western margin as it traversed the narrow ledge of slickrock on the mesa edge (see Stein 1983:Figure 8:6).

A collection of sherds were taken from this stairway by Vivian and Buettner during the 1970-71 excavations. These are now in the collections of the Chaco Center and were recently examined by Daisy Levine and Tom Windes who agreed that the assemblage exhibited a high incidence of northern influence and dated very late in the Chaco sequence. Tom Windes (1982:25-26) documented the rockcut stairway (29SJ611) which ascends to Penasco Blanco on the south margin of the Chaco. Windes suggests that the stair 29SJ611 represents a continuation of the Ah-shi-sle-pah alignment but finds that associated ceramic assemblages differ. Ceramics indicate that after A.D. 1100 the Penasco segment lies abandoned, while Vivian's Stairway (29SJ604) continued in use. Sherds from this stairway are among the latest documented road assemblages.


R12W R11W
T22N
6
5
7
8
18
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19
20
24
3
174
173
Ramp
Ah-shi-sle-pah
6120
6180
6200
6241
6199
6259
6130
6151
6160
6100
6300
6242
6341
6224
6114

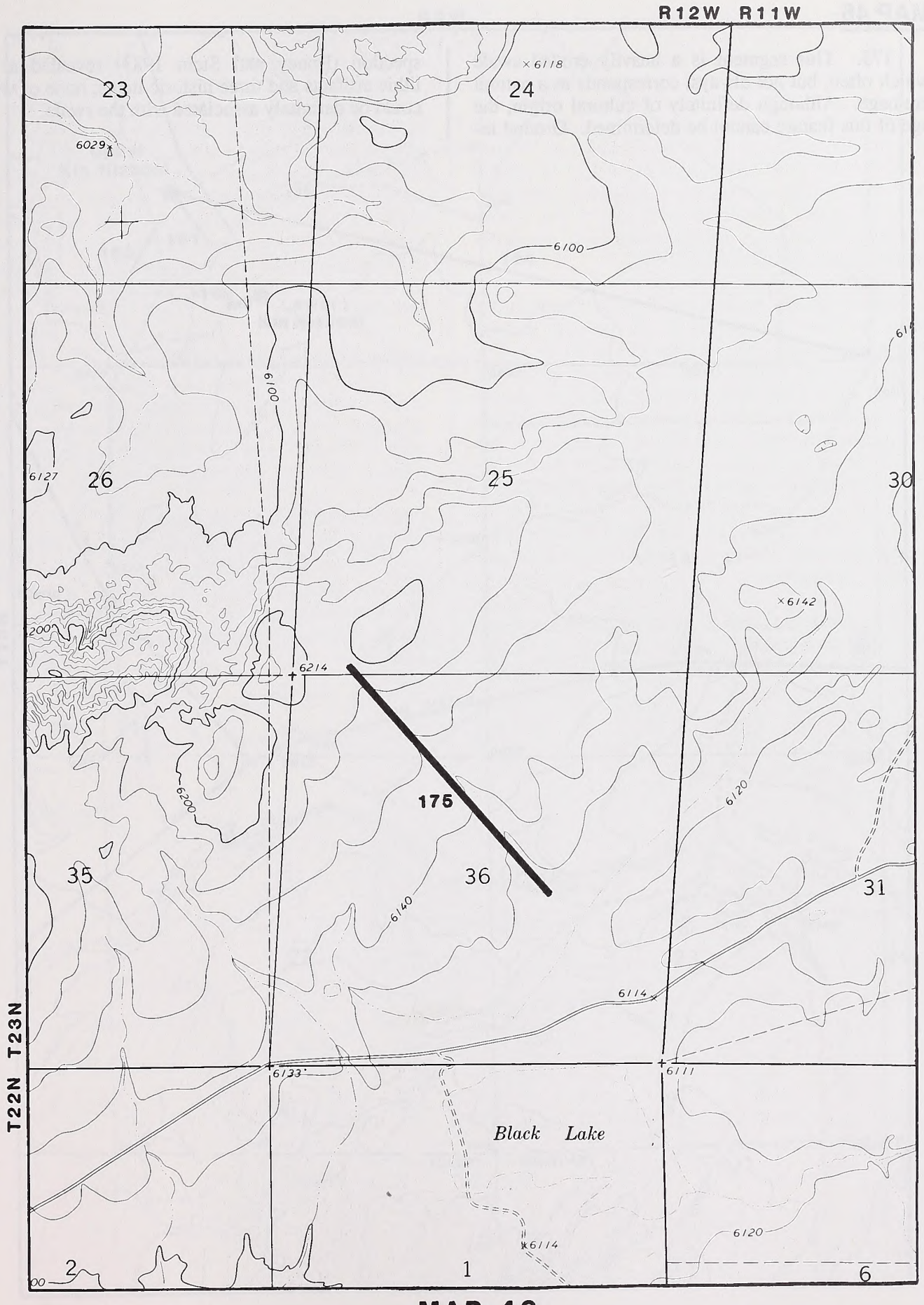
MAP 45

173. See notes for Map 44.

174. Prior to 1982 several attempts were made to find an extension of the Penasco Blanco to Ah-shi-sle-pah Road north of Ah-shi-sle-pah Wash (Stein 1983:8-10). Despite surface reconnaissance and inspection of aerial photography by several investigators, this segment remained elusive until it was spotted in 1982 during early morning aerial reconnaissance. Once recognized, it could be seen on aerial photography and located on the ground. Surface inspection shows a shallow, parabolic swale, 12 meters wide, visible intermittently. At the southern end of this segment is a ceramic scatter 300 meters long and 25 meters wide, corresponding to the projected road alignment (Roney and Stein 1983).

Ah-shi-sle-pah Ramp (LA 34324)

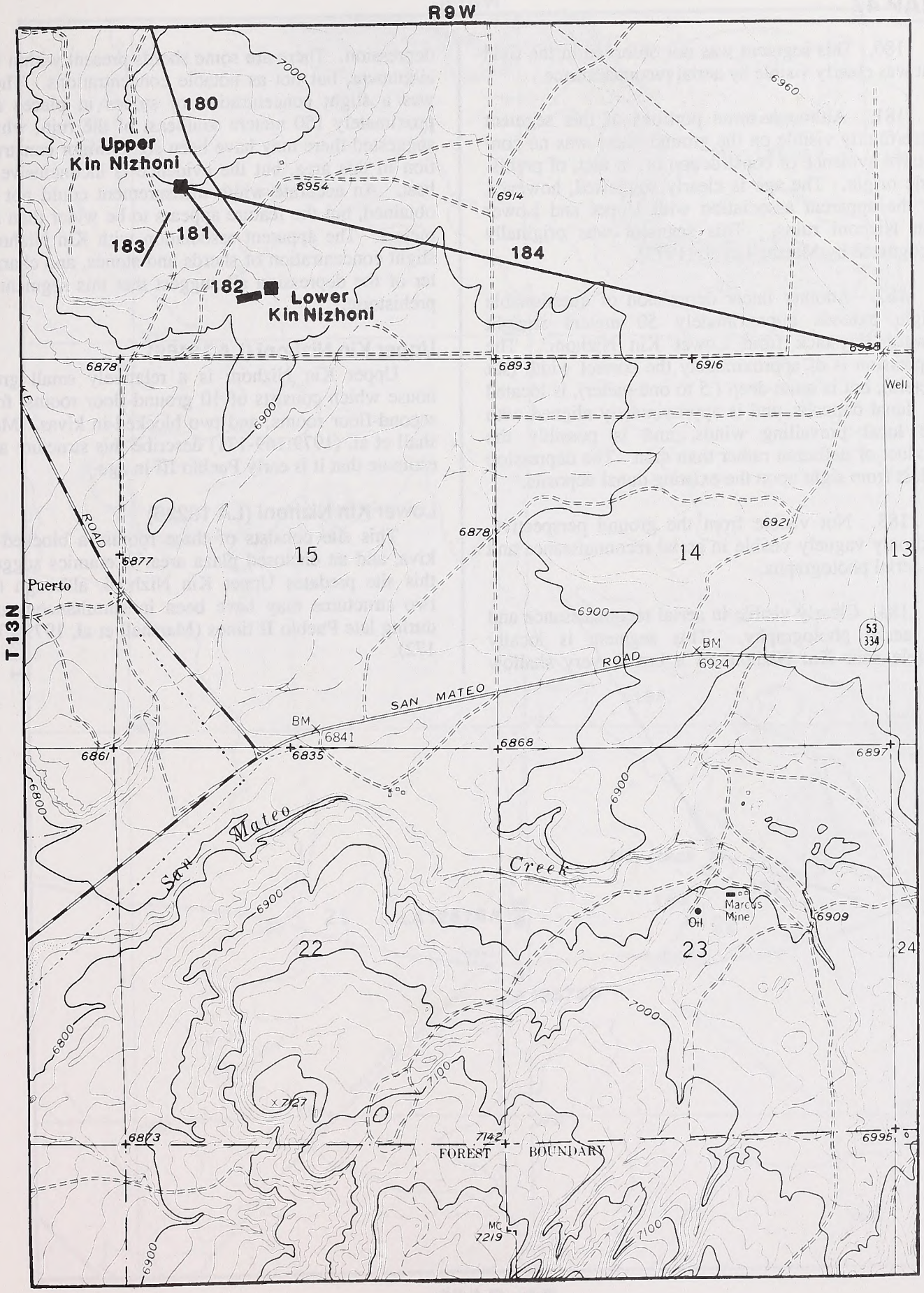
The Ah-shi-sle-pah Ramp (Stein 1983: 8-9-10) was discovered in the summer of 1973 by the field crew for the Remote Sensing Project (Morrison 1973, 1979). Although Vivian and Buettner noted the structure in 1970-71 (Vivian 1983:A-9), they presumed the Penasco Blanco to Ah-shi-sle-pah Roadway to enter the canyon further to the south and did not, therefore, recognize the structure as a road feature. The structure was documented during Phase I of the Roads Project and is described in detail in Appendix II of this report. The Ah-shi-sle-pah Ramp appears to represent a masonry platform stairway which provides a landing for a scaffold or cut masonry steps. The location of the feature, some 6.3 kilometers north-northwest of Penasco Blanco represents the only break in the sheer sandstone cliffs flanking Ah-shi-sle-pah Wash. Here a peninsula of sandstone forms a natural ramp to the canyon bottom. Only a moderate amount of effort was necessary to bridge the gap between the canyon floor and the toe of the slickrock peninsula. The rubble mound which represents the ramp measures 23 by 11 meters and approaches two meters in present height. Unfortunately the mound is heavily reduced and wall alignments, if any, are not visible. An interesting aspect of this structure, which has been commented on by virtually every investigator to visit here, is the conspicuous red color of the mound, presumably caused by an intense fire. Examination of the cliff face (which shows no such reddening) and material culture on the mound surface suggests the structure was constructed of masonry elements which were previously, possibly purposely, fire reddened.


R12W R11W
T22N T23N
23
24
26
25
30
35
36
31
1
2
6
6029
×6118
6100
6127
6214
6200
6140
6120
×6142
6114
6133
6111
175
Black Lake
×6114

MAP 46

MAP 46

175. This segment is a heavily eroded swale which often, but not always, corresponds to a natural drainage. Although definitely of cultural origin, the age of this feature cannot be determined. Ground inspection (Roney and Stein 1983) revealed a few lithic artifacts and three historic items, none of which could be definitely associated with the swale.


R9W
T13N
180
Upper
Kin Nizhoni
181
183
182
Lower
Kin Nizhoni
184
6954
6914
6960
6878
6893
6916
6938
Well
6900
ROAD
6877
Puerto
15
14
13
6878
6921
6900
53
334
BM
6924
ROAD
SAN MATEO
BM
6841
6861
6835
6868
6897
6800
San Mateo Creek
6900
Marcos
Mine
Oil
6909
22
23
24
7000
6800
7100
7127
6873
7142
FOREST BOUNDARY
6995
MC
7219
7100
6900

MAP 47

180. This segment was not observed in the field but was clearly visible by aerial reconnaissance.

181. Although some portions of this segment were faintly visible on the ground, there was no conclusive evidence of construction or, in fact, of prehistoric origin. The age is clearly suggested, however, by the apparent association with Upper and Lower Kin Nizhoni ruins. This segment was originally recognized by Marshall et al. (1979).

182. Another linear depression of questionable origin extends approximately 50 meters straight toward Haystack from Lower Kin Nizhoni. The depression is of approximately the correct width (six meters), but is quite deep (.5 to one meter), is located on dunal deposits, and is approximately aligned with the local prevailing winds, and is possibly the product of deflation rather than man. The depression is lost from sight upon the existing dunal deposits.

183. Not visible from the ground perspective, and only vaguely visible in aerial reconnaissance and on aerial photographs.

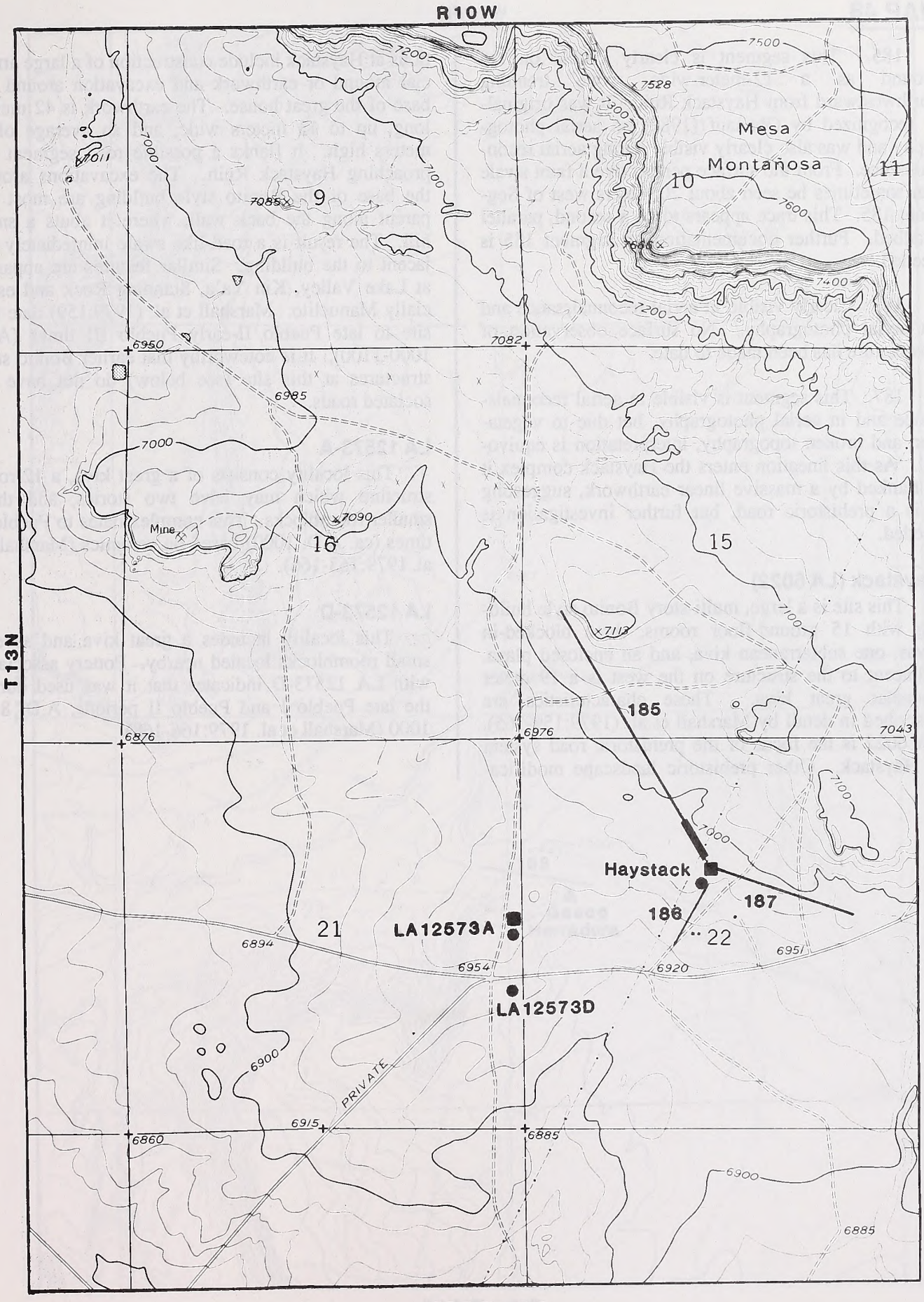
184. Clearly visible in aerial reconnaissance and on aerial photography. This segment is locally visible near Kin Nizhoni as a broad, very shallow depression. There are some sherds present within the alignment, but not as notable concentrations. There was a slight concentration of stones in places approximately 150 meters southeast of the ruin, which suggested there may have been some minor construction in this area, but the evidence is inconclusive at best. An accurate width measurement could not be obtained, but the feature appears to be wider than six meters. The apparent association with Kin Nizhoni, slight concentration of sherds and stones, and character of the depression all suggest that this segment is prehistoric.

Upper Kin Nizhoni (LA 18166)

Upper Kin Nizhoni is a relatively small great house which consists of 10 ground-floor rooms, four second-floor rooms, and two blocked-in kivas. Marshall et al. (1979:169-171) describe this structure and estimate that it is early Pueblo III in age.

Lower Kin Nizhoni (LA 18226)

This site consists of three rooms, a blocked-in kiva, and an enclosed plaza area. Ceramics suggest this site predates Upper Kin Nizhoni, although the two structures may have been in simultaneous use during late Pueblo II times (Marshall et al. 1979:171-172).


R10W
T13N
Mesa
Montañosa
10
11
9
15
16
21
22
Mine
185
186
187
Haystack
LA12573A
LA12573D
PRIVATE
7500
7528
7200
7300
7100
7000
7600
7400
7085
7090
7113
7082
7043
6950
6985
6876
6976
6894
6954
6920
6951
6900
6915
6860
6885

MAP 48

185. This segment is clearly visible on the ground as a 12-meter-wide swale trending northwestward from Haystack Ruin. It was originally recognized by Obenauf (1980) on aerial photography and was also clearly visible during aerial reconnaissance. From the surface perspective a faint swale can sometimes be seen about 20 meters west of Segment 185. This trace appears to be a second, parallel roadbed. Further documentation of Segment 185 is needed.

186. Clearly visible in aerial reconnaissance and on aerial photography. No surface observation of this feature has been made to date.

187. This segment is visible in aerial reconnaissance and in aerial photography, but due to vegetation and broken topography, interpretation is equivocal. As this lineation enters the Haystack complex it is flanked by a massive linear earthwork, suggesting it is a prehistoric road, but further investigation is needed.

Haystack (LA 6022)

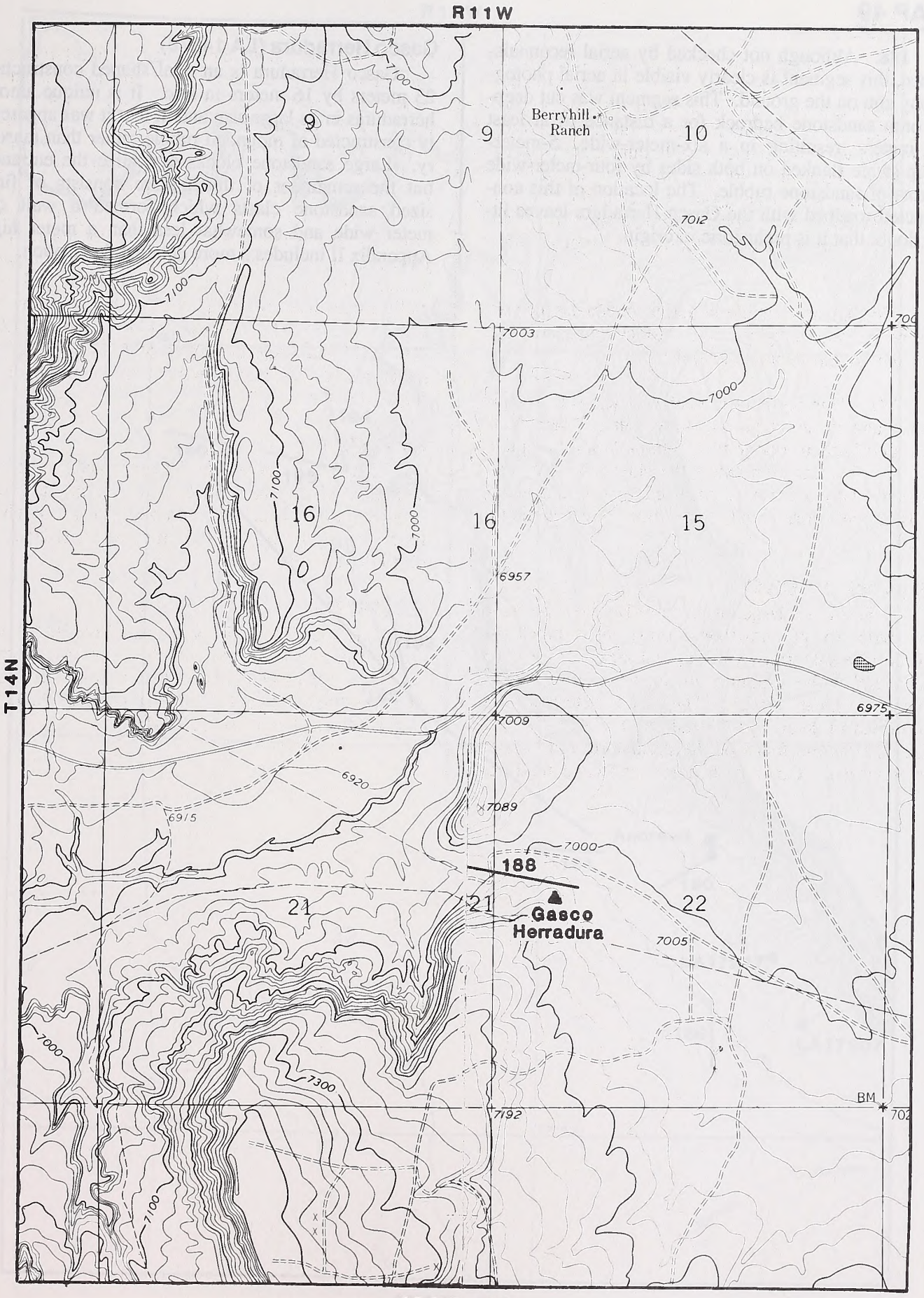
This site is a large, multi-story Bonito style building with 15 ground-floor rooms, three blocked-in kivas, one subterranean kiva, and an enclosed plaza. Adjacent to the structure on the west is a 19 meter diameter great kiva. These characteristics are described in detail by Marshall et al. (1979:159-165). LA 6022 is the focus of the prehistoric road system at Haystack. Other prehistoric landscape modifications at Haystack include construction of a large artificial mound or earthwork and excavation around the base of the great house. The earthwork is 42 meters long, up to 13 meters wide, and an average of .5 meters high. It flanks a possible road segment approaching Haystack Ruin. The excavations around the base of the Bonito style building are most apparent along the back wall, where it abuts a small hill. The result is a road-like swale immediately adjacent to the building. Similar features are apparent at Lake Valley, Kin Ya'a, Standing Rock and especially Manuelito. Marshall et al. (1979:159) date this site to late Pueblo II-early Pueblo III times (A.D. 1000-1100). It is noteworthy that earlier Bonito style structures at this site (see below) do not have associated roads.

LA 12573-A

This locality consists of a great kiva, a 12-room structure which may have two stories, and three smaller roomblocks. This complex dates to Pueblo II times (ca. A.D. 1000) based on ceramics (Marshall et al. 1979:163-166).

LA 12573-D

This locality includes a great kiva and several small roomblocks located nearby. Pottery associated with LA 12573-D indicates that it was used during the late Pueblo I and Pueblo II periods, A.D. 850-1000 (Marshall et al. 1979:166-168).

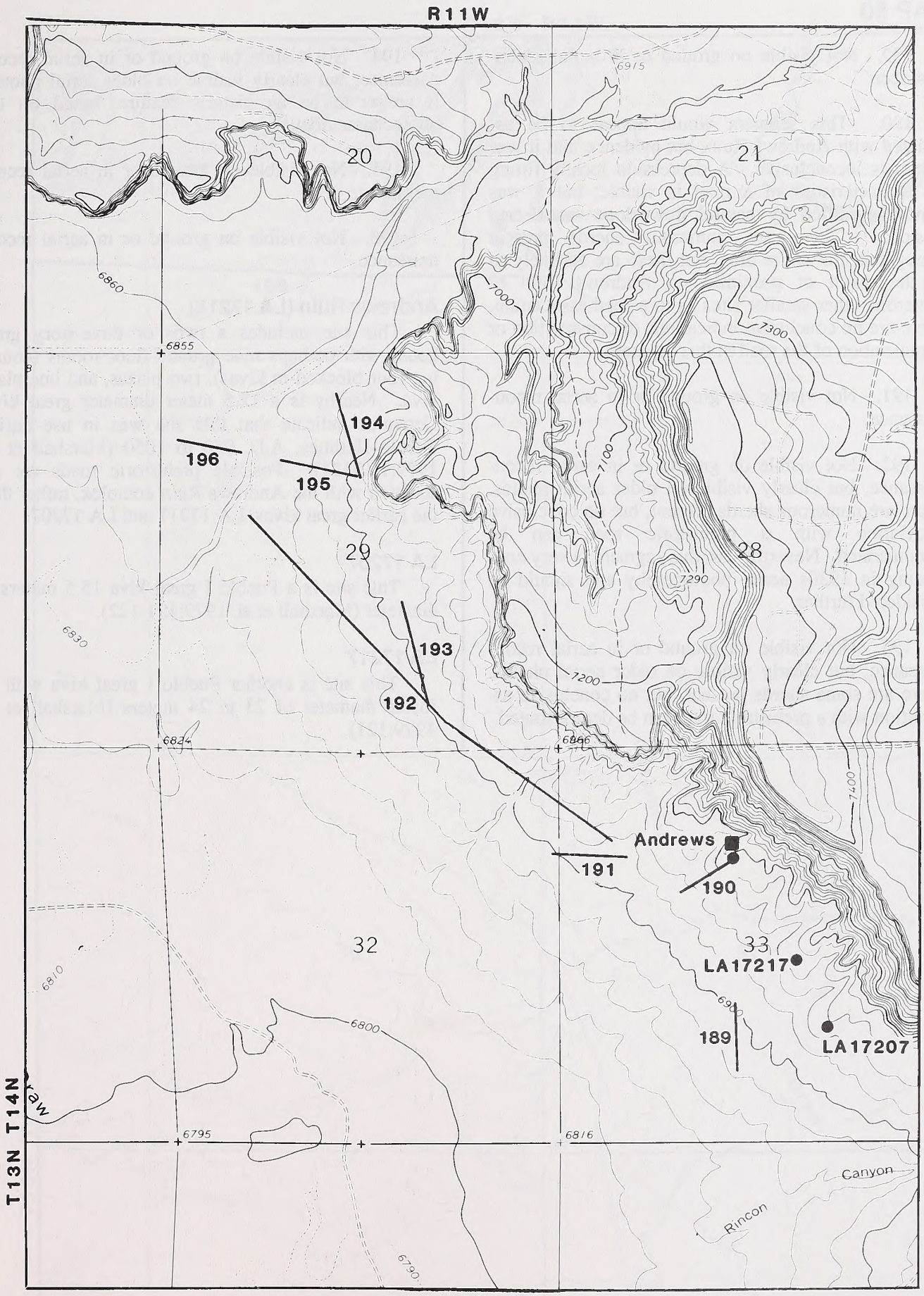

R11W
T14N
Berryhill Ranch
9
10
16
15
21
22
188
Gasco
Herradura
7012
7003
7000
6957
6975
7009
6920
7089
6915
7005
7300
7192
BM

MAP 49

188. Although not checked by aerial reconnaissance, this segment is clearly visible in aerial photography and on the ground. This segment was cut deeply onto sandstone bedrock for a distance of at least 75 meters, resulting in a six-meter-wide, .5-meter-deep swale flanked on both sides by four-meter-wide berms of sandstone rubble. The location of this constructed roadbed with the Gasco Herradura leaves little doubt that it is prehistoric in origin.

Gasco Herradura (LA 14878)

Gasco Herradura is an oval shaped construction 23 meters by 16 meters in size. It is unique among herraduras in its large size and in that it was apparently constructed of mounded rubble rather than masonry. Large sandstone blocks formalize the entrance, but the remainder of this feature consists of first-sized sandstone clasts which formed a wall one meter wide and somewhat less than a meter high. Appendix II includes a more detailed description.


R11W
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6855
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6866
7400
6810
6800
6795
6816
6790
194
196
195
193
192
191
190
189
Andrews
LA17217
LA17207
Canyon
Rincon

MAP 50

MAP 50

189. Not visible on ground or in aerial reconnaissance.

190. This segment would appear to be associated with Andrews Ruin, but evidence that it was a road is inconclusive. A depression locally fitting the characteristics of a road is visible, but it was heavily modified by natural downslope runoff and erosion. There are numerous sherds present throughout this entire area, but these are as likely to be the result of proximity to Andrews Ruin or numerous other smaller sites as to a road association. There are no conclusive indications of construction or formalization of the road in this segment.

191. Not visible on ground or in aerial reconnaissance.

192. Not visible on ground or in aerial reconnaissance, but clearly visible on older aerial photos. There are numerous sherds present, but no conclusive association with a prehistoric road can be demonstrated. Nevertheless, this segment is very convincing in 1930s aerial photography and should be considered further.

193. Not visible on ground or in aerial reconnaissance, but clearly visible on older aerial photos. There are some sherds present, but no conclusive association with a prehistoric road can be demonstrated.

194. Not visible on ground or in aerial reconnaissance, but clearly visible on older aerial photos. It seems to be an historic feature, based on the photocharacteristics.

195. Not visible on ground or in aerial reconnaissance.

196. Not visible on ground or in aerial reconnaissance.

Andrews Ruin (LA 17218)

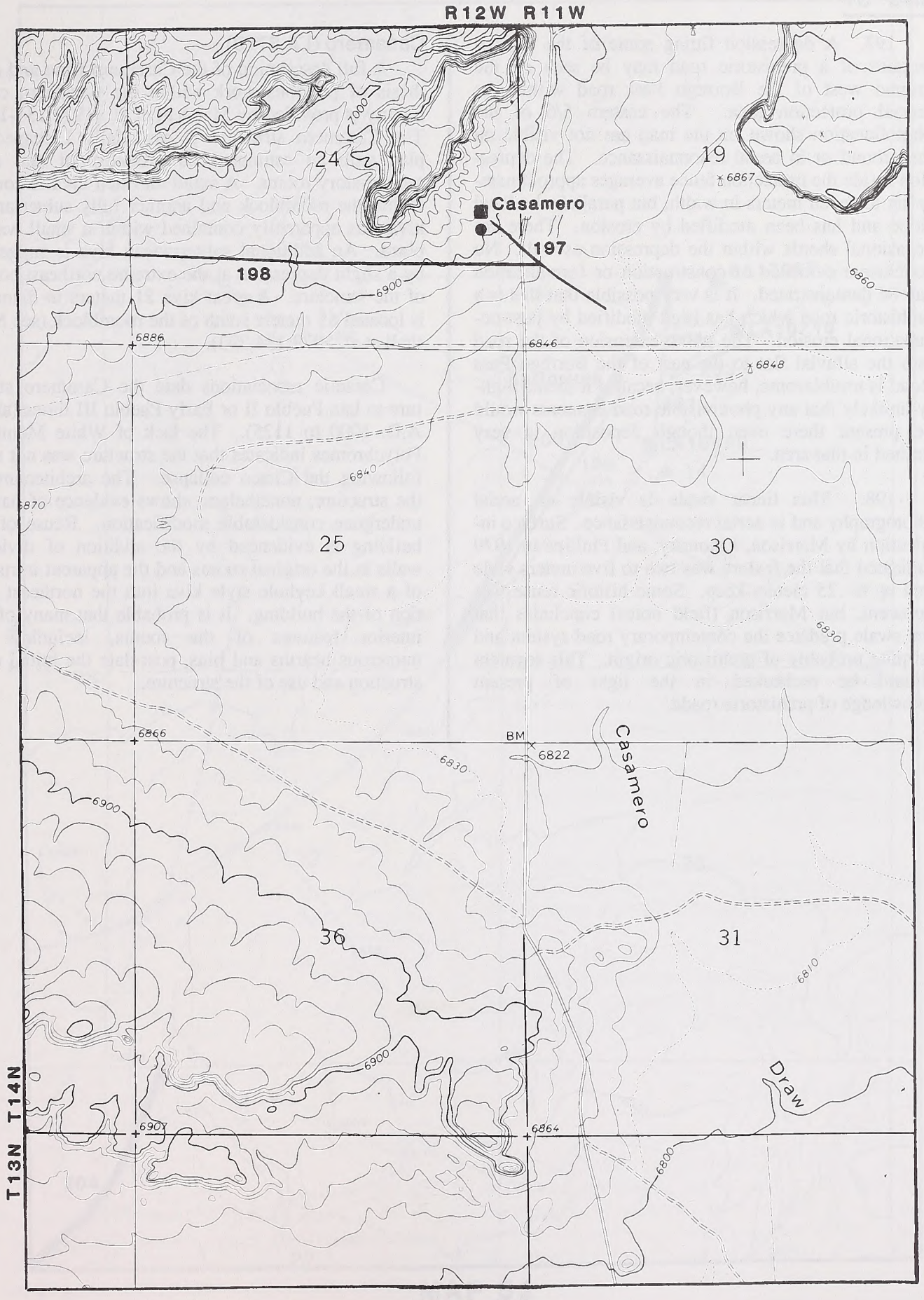
This site includes a two- or three-story great house with perhaps nine ground-floor rooms (counting four blocked-in kivas), two plazas, and one plaza kiva. Nearby is a 12.5 meter diameter great kiva. Ceramics indicate that this site was in use during Pueblo II times, A.D. 950 to 1050 (Marshall et al. 1979:117-121). Possible prehistoric roads are associated with the Andrews Ruin complex, rather than the earlier great kivas, LA 17217 and LA 17207.

LA 17207

This site is a Pueblo I great kiva 15.5 meters in diameter (Marshall et al. 1979:121-122).

LA 17217

This site is another Pueblo I great kiva with an inside diameter of 23 to 24 meters (Marshall et al. 1979:121).


R12W R11W
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Casamero
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6870
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6900
6830
6866
BM
6822
Casamero
6810
6907
6864
6800
Draw

MAP 51

MAP 51

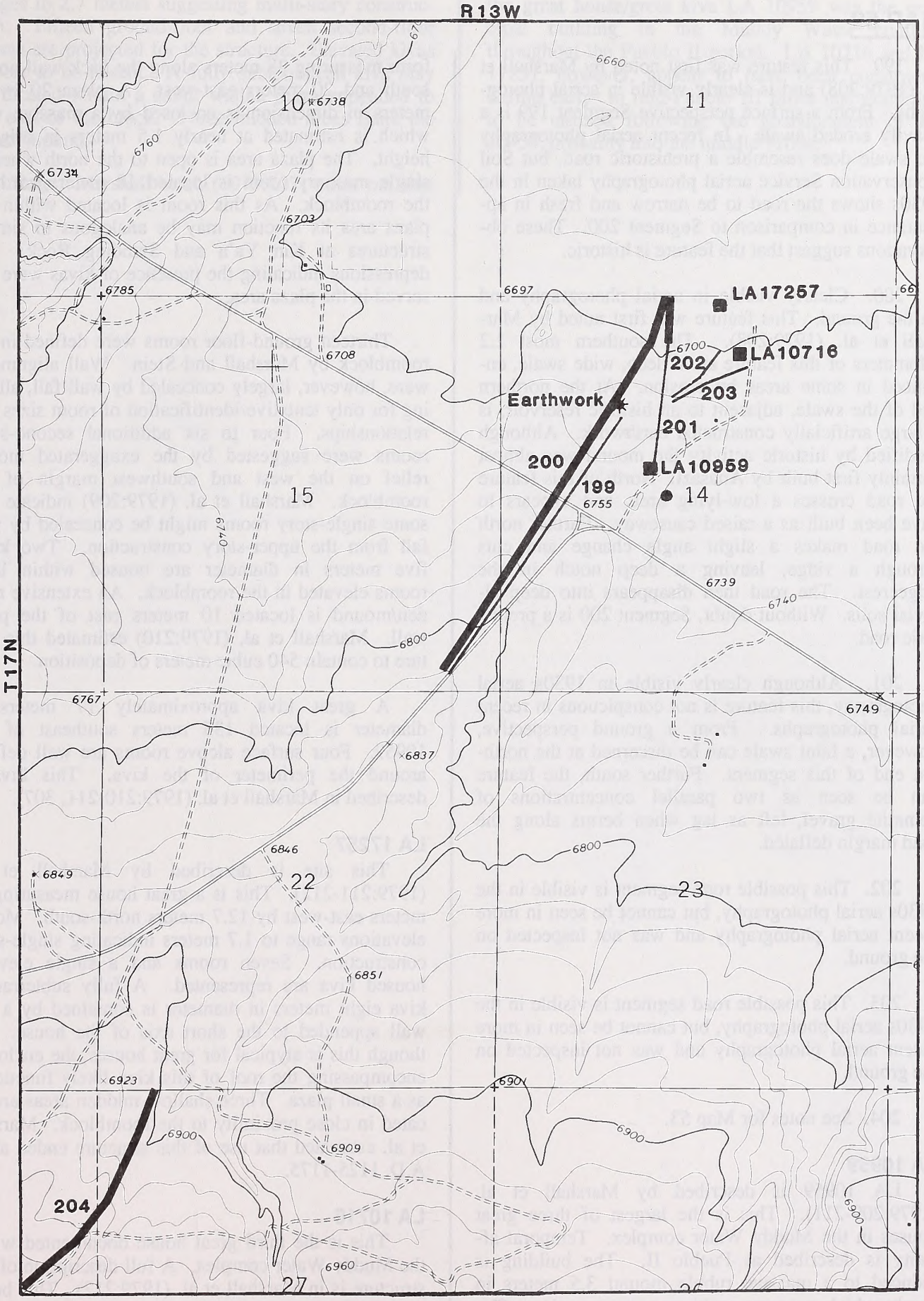
197. A depression fitting some of the characteristics of a prehistoric road may be seen on the ground west of the Borrego Pass road within the fenced protection area. The eastern 5/6 of the photolineation shown on the map are not visible on the ground or in aerial reconnaissance. The depression inside the protection fence averages approximately six to seven meters in width, but parallels the local slope and has been modified by erosion. There are occasional sherds within the depression as well. No conclusive evidence of construction or formalization can be demonstrated. It is very possible that this is a prehistoric road which has been modified by post-occupational erosion. The photo-extension of the road into the alluvial flat to the east of the Borrego Pass Road is troublesome, however, because it seems highly unlikely that any photovisible road elements would be present there even though deposition is very limited in that area.

198. This linear swale is visible on aerial photography and in aerial reconnaissance. Surface inspection by Morrison, Lutonsky, and Phillips in 1979 indicated that the feature was two to five meters wide and up to .25 meters keep. Some historic reuse was apparent, but Morrison (field notes) concludes that the swale predates the contemporary road system and is quite probably of prehistoric origin. This segment should be rechecked in the light of present knowledge of prehistoric roads.

Casamero (LA 8779)

A full description of the Casamero Ruin and synthesis of previous work within the Casamero community is provided by Marshall et al. (1979:131-140). The Casamero structure is essentially L-shaped in plan with an estimated 20 ground-floor and nine second-story rooms. A small elevated kiva is housed within the roomblock and another fully subterranean kiva was apparently contained within a small walled plaza. An additional subterranean kiva is suggested by a slight depression at the extreme northeast corner of the structure. A great kiva 21 meters in diameter is located 65 meters south of the roomblock (see Marshall et al. 1979:134,293).

Ceramic associations date the Casamero structure to late Pueblo II or Early Pueblo III times (about A.D. 1000 to 1125). The lack of White Mountain Polychromes indicates that the structure was not used following the Chaco collapse. The architecture of the structure, nonetheless, shows evidence of having undergone considerable modification. Reuse of the building is evidenced by the addition of dividing walls in the original rooms and the apparent intrusion of a small keyhole style kiva into the northeast section of the building. It is probable that many of the interior features of the rooms, including the numerous hearths and bins, post-date the initial construction and use of the structure.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6800
6767
6749
6837
6846
6849
6851
6923
6901
6900
6909
6960
LA17257
LA10716
LA10959
Earthwork
200
201
202
203
204
199
6755

MAP 52

MAP 52

199. This feature was first noted by Marshall et al. (1979:208) and is clearly visible in aerial photography. From a surface perspective Segment 199 is a heavily eroded swale. In recent aerial photography the swale does resemble a prehistoric road, but Soil Conservation Service aerial photography taken in the 1930s shows the road to be narrow and fresh in appearance in comparison to Segment 200. These observations suggest that the feature is historic.

200. Clearly visible in aerial photography and on the ground. This feature was first noted by Marshall et al. (1979:208). The southern most 1.2 kilometers of this feature are a deep, wide swale, enhanced in some areas by erosion. At the northern end of the swale, adjacent to an historic reservoir, is a large artificially constructed earthwork. Although modified by historic activity the mound was almost certainly first built by Anasazi. North of this feature the road crosses a low-lying area, and appears to have been built as a raised causeway. Further north the road makes a slight angle change and cuts through a ridge, leaving a deep notch in the ridgecrest. The road then disappears into deep alluvial soils. Without doubt, Segment 200 is a prehistoric road.

201. Although clearly visible in 1930s aerial photography, this feature is not conspicuous in recent aerial photographs. From a ground perspective, however, a faint swale can be discerned at the northern end of this segment. Further south, the feature can be seen as two parallel concentrations of hematite gravel, left as lag when berms along the road margin deflated.

202. This possible road segment is visible in the 1930s aerial photography, but cannot be seen in more recent aerial photography and was not inspected on the ground.

203. This possible road segment is visible in the 1930s aerial photography, but cannot be seen in more recent aerial photography and was not inspected on the ground.

204. See notes for Map 53.

LA 10959

LA 10959 is described by Marshall et al. (1979:209-211). This is the largest of three great houses in the Muddy Water complex. Temporal affinity is described as Pueblo II. The building is reduced to a massive rubble mound 3.5 meters in height which suggests multi-story construction. The roomblock is constructed in an abbreviated L-shaped form measuring 38 meters along the back wall north-south and 20 meters east-west. A plaza 20 by 40 meters in dimension is enclosed by a massive wall which is estimated at nearly 1.5 meters in original height. The plaza area is open to the north where a single masonry room is located 18 meters north of the roomblock. As this room is located within the plaza area its function may be analogous to similar structures at Kin Ya'a and Standing Rock. No depressions indicating the presence of kivas were observed in the plaza area.

Thirteen ground-floor rooms were defined in the roomblock by Marshall and Stein. Wall alignments were, however, largely concealed by wall fall, allowing for only tentative identification of room sizes and relationships. Four to six additional second-story rooms were suggested by the exaggerated mound relief on the west and southwest margin of the roomblock. Marshall et al. (1979:209) indicate that some single-story rooms might be concealed by wall fall from the upper-story construction. Two kivas five meters in diameter are housed within large rooms elevated in the roomblock. An extensive midden/mound is located 10 meters east of the plaza wall. Marshall et al. (1979:210) estimated this feature to contain 540 cubic meters of deposition.

A great kiva approximately 17 meters in diameter is located 135 meters southeast of LA 10959. Four surface alcove rooms are well defined around the perimeter of the kiva. This kiva is described in Marshall et al. (1979:210-211, 307).

LA 17257

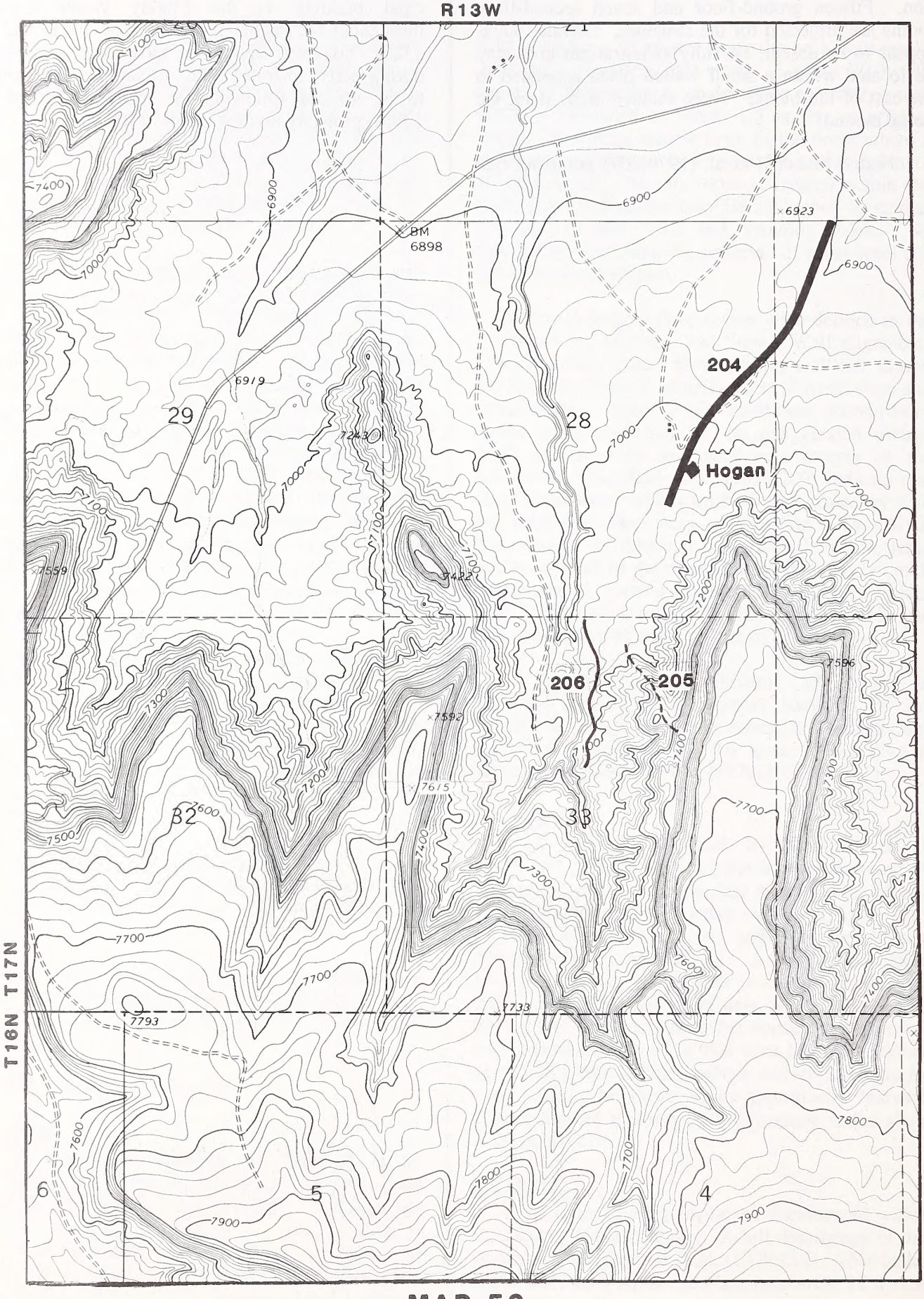
This site is described by Marshall et al. (1979:211-212). This is a great house measuring 30 meters east-west by 12.7 meters north-south. Mound elevations range to 1.7 meters indicating single-story construction. Seven rooms and a single elevated housed kiva are represented. A fully subterranean kiva eight meters in diameter is contained by a low wall appended to the short axis of the house. Although this is atypical for great houses, the enclosure encompassing the roof of this kiva likely functioned as a small plaza. Three shallow midden areas are located in close proximity to the roomblock. Marshall et al. estimated that use of this structure ended about A.D. 1125-1175.

LA 10716

This is the third great house documented within the Muddy Water complex. A full description of this structure is in Marshall et al. (1979:212). This building is essentially square in plan, measuring 22 meters east-west by 21 meters north-south. Mound relief

ranges to 2.7 meters suggesting multi-story construction. Fifteen ground-floor and seven second-floor rooms are projected for the structure. Elevated kivas appear to be absent. A fully subterranean kiva may be located within a small walled plaza appended to the east of the block. Three midden areas flank the house mound.

Note: Marshall et al. (1979:207) point out that the great house/great kiva LA 10959 was the principal building in the Muddy Water complex throughout the Pueblo II period. LA 10716 and LA 17257, however, appear to have been constructed during early- to mid-Pueblo III times and continued to be utilized following the abandonment of LA 10959, probably into the middle 1100s.


R13W
T16N T17N
BM
6898
6923
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7243
7422
7559
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7593
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7733
204
205
206
Hogan
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33
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5
4

MAP 53

MAP 53

204. Clearly visible in aerial photography and on the ground. This segment appears as a 16- to 18-meter-wide swale which is continuously visible over its 1.4 kilometer length. At its southern end the road enters moderately dissected terrain where notches on ridgecrests represent a continuation of the feature. Juniper trees up to .35 meters in diameter grow within the swale, attesting to its age. The possibility that this feature might be an historic canal is discounted because it does not emanate from any major catchment or source of water, and because it leads down a relatively steep grade which would surely erode if it carried a large volume of water. Identifiable ceramics included McElmo Black-on-white (two sherds), Gallup Black-on-white (one sherd), Red Mesa Black-on-white (three sherds), and Escavada Black-on-white (two sherds). Historic Navajo remains are also relatively common in this area.

205. All along the spire of this ridge is a relatively dense scatter of ceramics, which may reflect a continuation of the prehistoric road. However, no evidence of construction was noted. Sherds noted are as follows:

	Jar	Bowl	Indeterminate
Gallup B/W	18	0	0
Red Mesa B/W	6	0	0
Whiteware	24	5	0
Corrugated Indented	3	0	0
Plain	2	0	4
Indeterminate	2	0	2
Total	**55**	**0**	**11**

It is of considerable interest that no bowl sherds were found. Residents at the mouth of the canyon reported a seep which never goes dry just below the rim of the mesa in this area. We did not locate this water source, but the exclusive occurrence of jars on the slope could indicate that this was a route to water. Reconnassiance along the uppermost line of cliffs in this area failed to locate steps or any other indication that a formal prehistoric road ascends to the mesa top.

206. This feature is an historic wagon road. Rocks have been cleared from an area about three meters wide, creating informal berms along its margin. The road is sinuous, conforming to topography. In some places dry laid, sandstone retaining walls were built to provide a level road surface.

APPENDIX II

An Inventory of Sites Significant to the Study of Chacoan Roads in the Southern San Juan Basin

By JOHN STEIN & JOHN RONEY

TABLE OF CONTENTS FOR APPENDIX II

SITE NAME	LA NUMBER	PAGE
Nose Rock	LA 14787	144
Gasco Herradura	LA 14878	148
Blue "J" Ruin	LA 18795	151
South Road No. 24	LA 34231	154
Ah-shi-sle-pah Ramp	LA 34324	156
Champignon	LA 36639	159
Como Huevo	LA 36727	162
Seven Lakes Herradura A	LA 38104	165
Seven Lakes Herradura B	LA 38105	168
Washout Roomblock	LA 38106	170
Road Cut Ruin	LA 38107	172
So-tsoh Basketmaker Village	LA 38108	174
Llave de la Mano Herradura	LA 38109	176
Llave de la Mano Platform	LA 38110	178
Rams Pasture Herradura	LA 38111	182
Mystery Feature	LA 38112	187
Coyote Canyon Herradura	LA 38453	189
Coyote Canyon Groove	LA 38454	192
(Unnamed)	LA 38455	193
Little Ear Herradura	La 38457	194
Kin Ya'a West Fork Road Cut	LA 40015	196
Ko'Pavi Herradura	LA 46008	199
Crownpoint Herradura	LA 46009	201
Grey Ridge Compound	LA 47856	203
Standing Rock Herradura	LA 47857	205
Deer Springs	LA 47858	207
Nous Petons du Fue	LA 47859	209

Nose Rock Herradura

LA Number: 14787

Reference: Previously recorded by the School of American Research on October 2, 1980, Project Number 38.

Recorders: John R. Stein, Daisy F. Levine; July 21, 1982

Temporal Affinity: A.D. 870 to 1175

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: South Chaco Road. The alignment of the South Road is ground-visible and passes below and immediately east of the structure.

Topographic Situation: The Nose Rock Herradura is situated at the crest of a major ridge overlooking an unnamed lateral to the Kim-me-ni-oli Wash. The ridgecrest and site area are accentuated by a small sandstone outcrop.

Visible Horizon: The alignment seems to coincide with Satan Pass on the southern horizon. The area of the Seven Lakes Herraduras to the south and the Credibility Gap Herradura to the north are visible.

Soil: Sandy loam

Vegetation: Open grassland with saltbush present

Primary Drainage: Kim-me-ni-oli Wash

Elevation: 6550'

Location:
Quad: Nose Rock, 7.5 min., USGS (Map 7)
UTM: Zone 12 770050 E 3974900 N
Legal: T19N R11W NW/4NE/4 Section 16

Site Description: The Nose Rock Herradura consists of two separate structures. Of the two, Structure A is most classically an herradura type feature. Structure B maintains many of the characteristics of an herradura but is unusual in many respects including the incorporation of several large sandstone boulders into the structural fabric.

Structure A
Shape: Horseshoe
Dimensions: 6 by 5m
Orientation: Southeast

Construction consists of low walls of compound masonry. Unshaped slabs and chunks of dense sandstone are utilized in construction. Walls probably never exceeded one meter in height and there is no evidence that the structure was ever roofed.

Structure B
Shape: Irregular
Dimensions: 12 by 8.5m
Orientation: Open to east & south-southeast

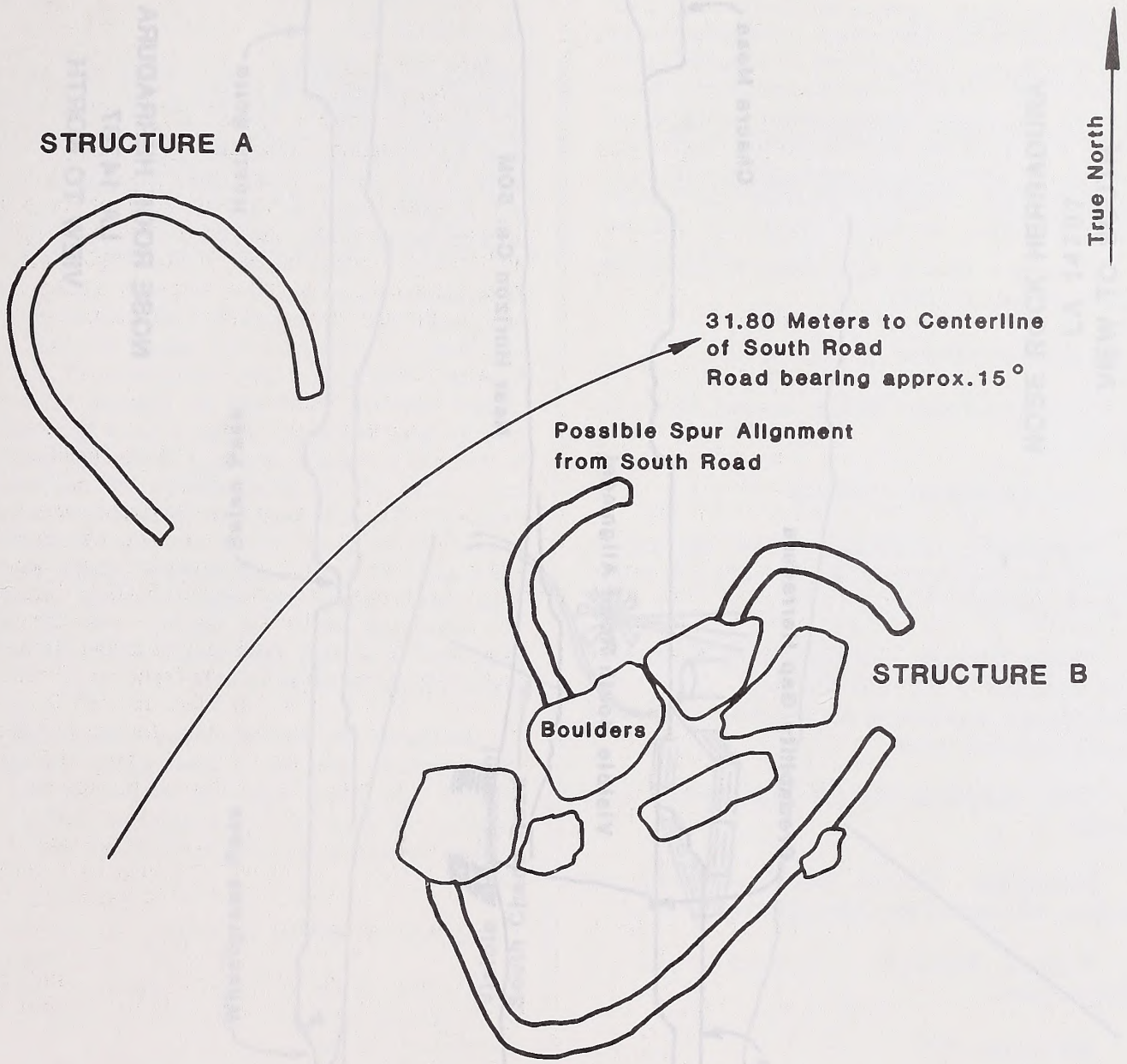
Structure B is two separate enclosures incorporating a low outcrop of sandstone boulders into the structural matrix. Walls are reduced but otherwise similar in all respects to those described for Structure A. Structure B is located six meters southeast of Structure A and it is possible that a loop from the South Road passes between the features. Otherwise the structures are located a short distance from the prehistoric right-of-way and about four meters above it. Some burned elements were observed in the rubble mass suggesting that hearths may be present.

Middens: No formal midden deposition is associated with the structures. A surficial scatter of ceramic debris and occasional lithic fragments exists in the immediate vicinity.

Ceramics (total for site area):			Indeterminate
Cibola Gray Ware	**Jar**	**Bowl**	
Corrugated Indented	4		
Cibola White Ware			
Undiagnostic	3	2	
Red Mesa B/W		6	
Gallup B/W	2		
Escavada B/W		3	
Carbon Painted White Ware			
Chaco McElmo B/W	1		

Lithics:	Frequency
Petrified wood	2

Comments: The Nose Rock Herradura was originally recorded as an historic Navajo structure. Upon re-examination, however there can be little doubt that the structure is a feature related to the South Road.



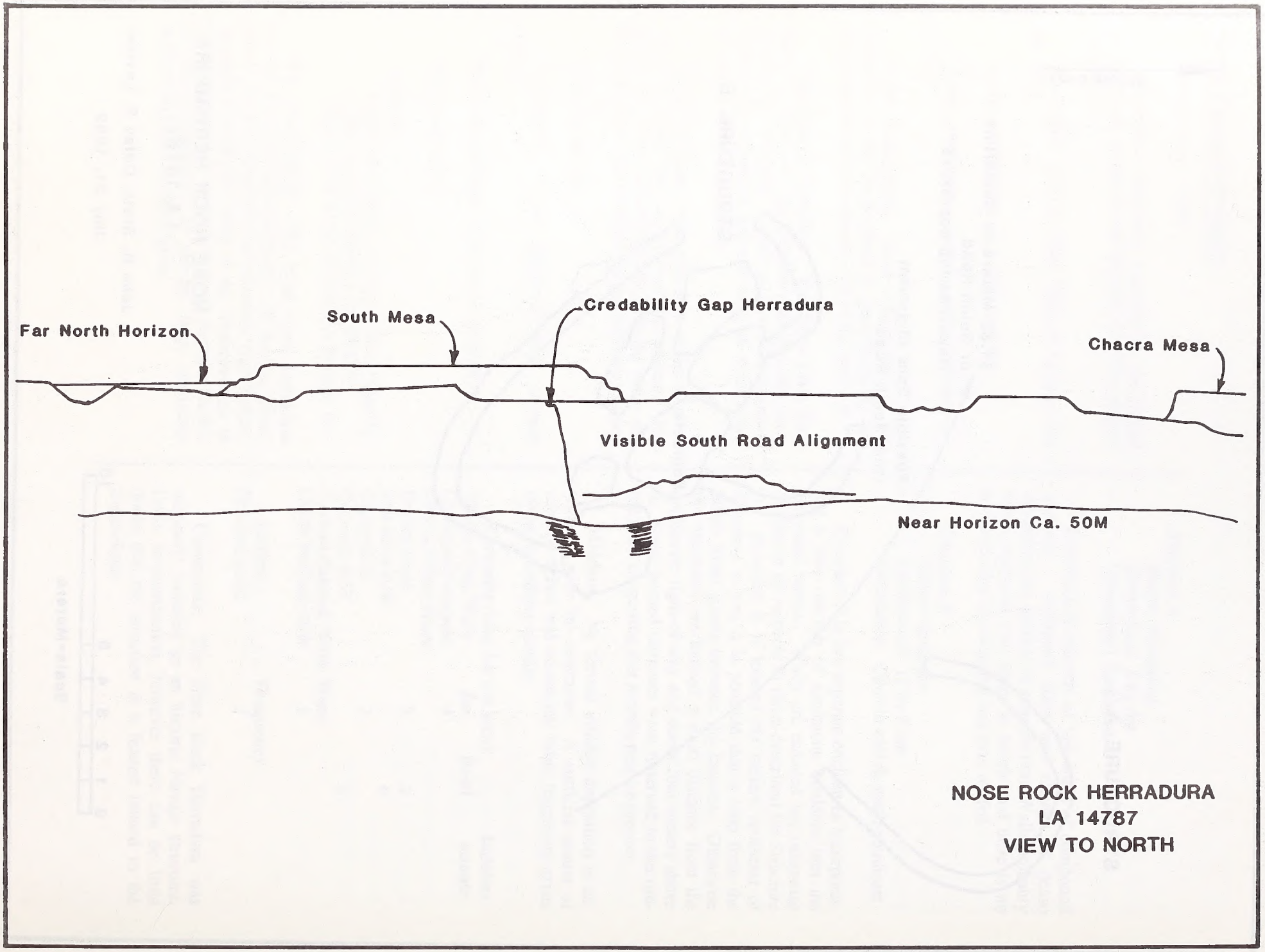
NOSE ROCK HERRADURA
LA 14787

John R. Stein, Daisy F. Levine

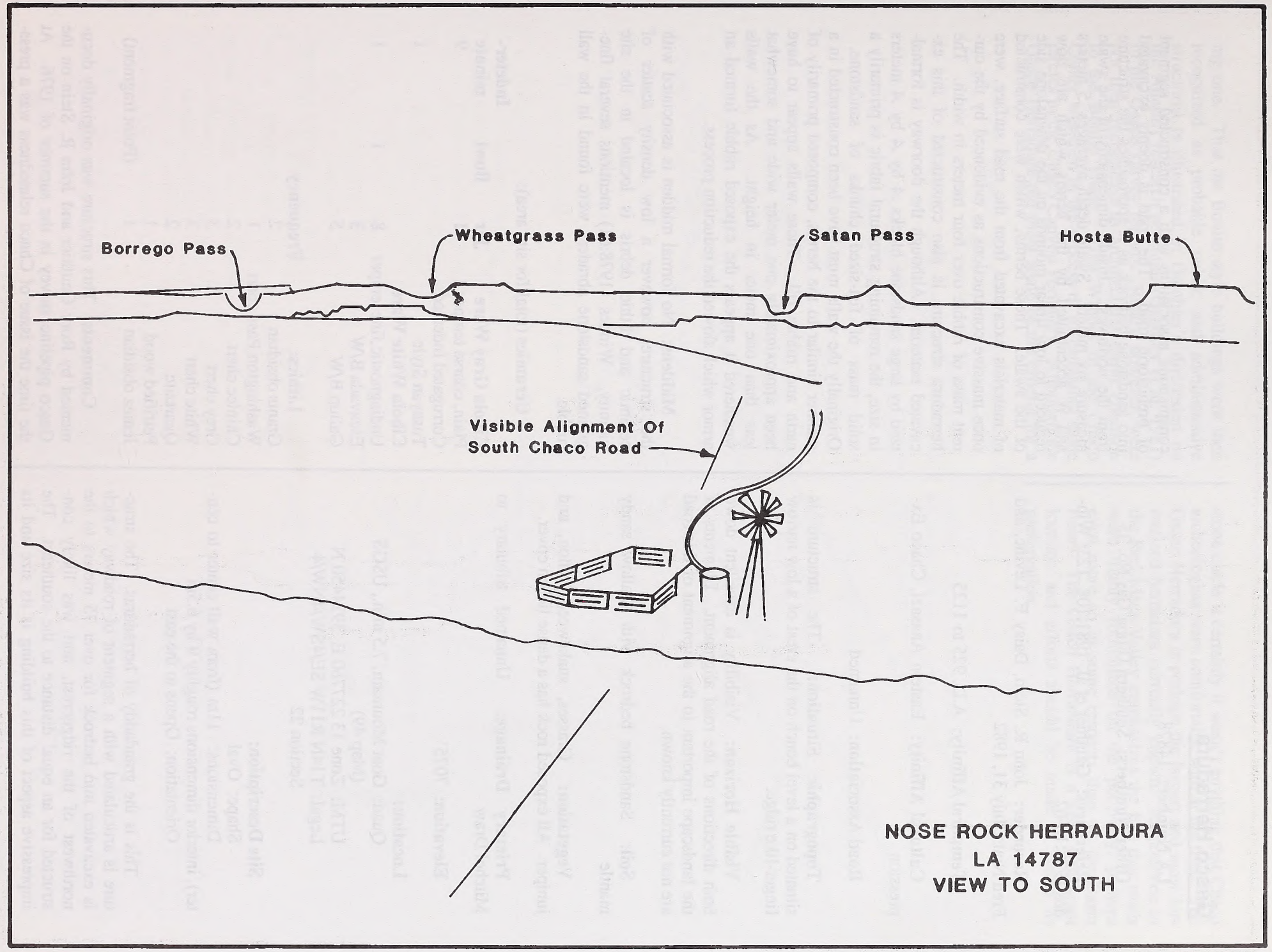
July 21, 1982

0 1 2 3 4 5 10

Scale-Meters



NOSE ROCK HERRADURA
LA 14787
VIEW TO NORTH



NOSE ROCK HERRADURA
LA 14787
VIEW TO SOUTH

Gasco Herradura

LA Number: 14878

Other Numbers: Southern Union Gas No. 35

References: Gauthier et al. 1981:108, 123; Windes 1978:16-62

Recorder: John R. Stein, Daisy F. Levine, and Fred Nials; July 31, 1982

Temporal Affinity: A.D. 925 to 1125

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: Unnamed

Topographic Situation: The structure is situated on a level bench on the crest of a low narrow finger-like ridge.

Visible Horizon: Visibility is excellent down both directions of the road alignment. Elements of the landscape important to the alignment of this road are not currently known.

Soil: Sandstone bedrock with shallow sandy mantle

Vegetation: Grasses, snakeweed, piñon, and juniper. All exposed rock has a dense lichen cover.

Primary Drainage: Unnamed tributary to Mitchel Draw

Elevation: 7075'

Location:
Quad: Goat Mountain, 7.5 min., USGS (Map 49)
UTM: Zone 13 227760 E 3924450 N
Legal: T14N R11W SE/4SW/4NW/4 Section 22

Site Description:
Shape: Oval
Dimensions: 11m (from wall center to center), interior dimensions roughly 9 by 6.5m
Orientation: Opens to the east

This is the grandaddy of herraduras. The structure is articulated with a segment of roadway which is excavated into bedrock for over 75 meters to the northwest of the ridgecrest, and was likely constructed for an equal distance to the southeast. The impressive aspect of this building is its size and its conspicuous association with a constructed segment of prehistoric road. The road is deeply excavated into sandstone bedrock as it approaches the structure from the northwest. Inside dimensions of the swale measure six meters. Swale depth averages .5 meters and is accentuated by the berms which are now reduced to low linear mounds on the downslope side of the swale. These berms, which were constructed of materials excavated from the road surface, were once massive constructions as evidenced by the current mass of rubble over four meters in width. The herradura structure is also constructed of this excavated material. Although the doorway is formalized by large sandstone blocks .4 by .4 by .4 meters in size, the remaining structural fabric is primarily a solid mass of fist-sized chunks of sandstone. Originally the walls must have been constructed in a manner similar to the berms, composed primarily of earth and rubble fill. These walls appear to have been approximately one meter wide and somewhat less than one meter in height. As the walls weathered it appears the exposed rubble formed an armor which slowed the reduction process.

Middens: No formal midden is associated with the structure, however a low density scatter of ceramic and lithic debris is located in the site vicinity. Windes (1978:61) mentions several fine-grained sandstone abraders were found in the wall rubble.

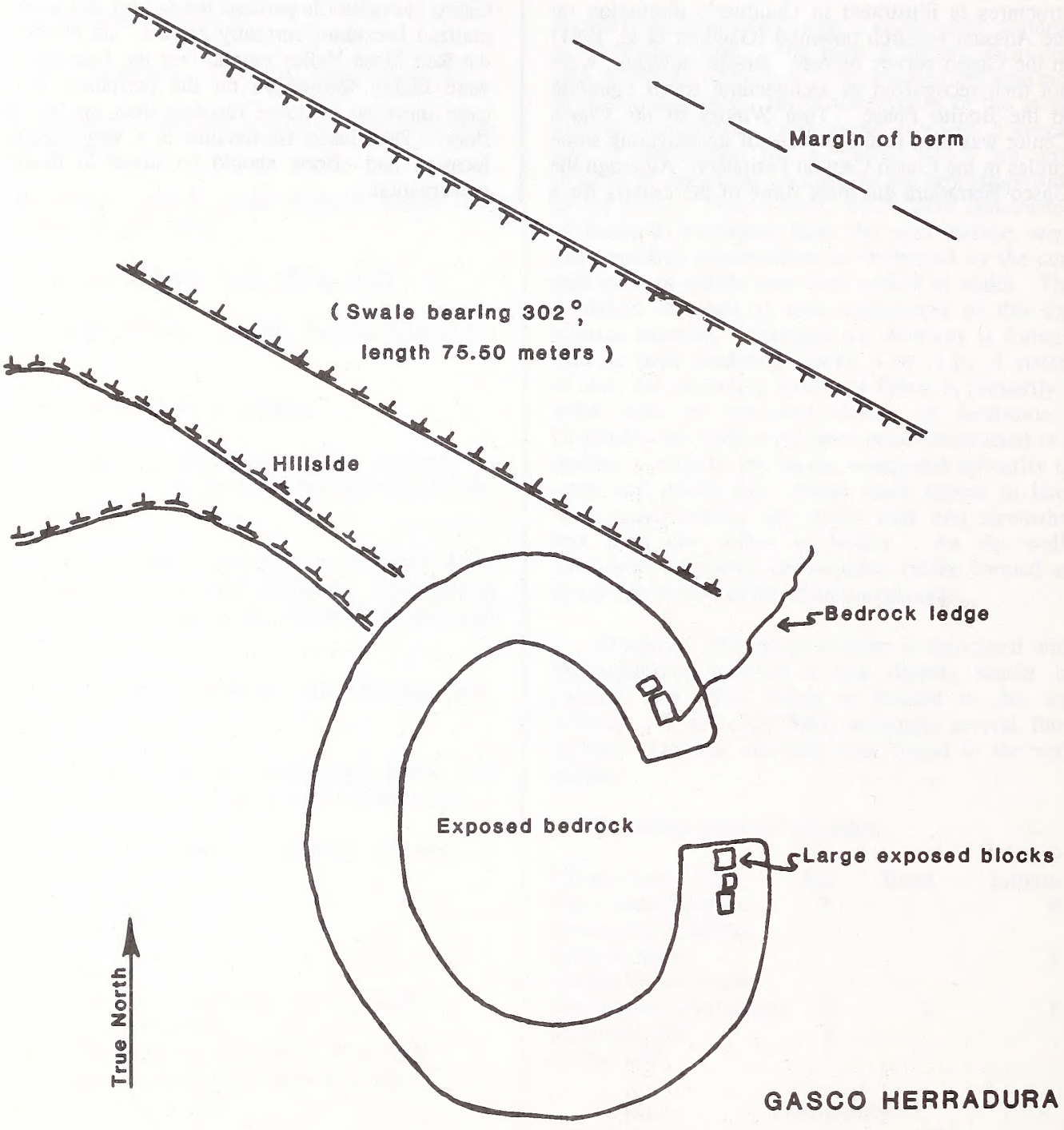
Ceramics (total for site area):

Cibola Gray Ware	**Jar**	**Bowl**	**Indeterminate**
Plain, coarse temper	1		9
Corrugated Indented, Tusayan Style			1
Cibola White Ware			
Undiagnostic,fine temper	8	1	1
Escavada B/W	3		
Gallup B/W	5		

Lithics:	**Frequency**	
Grants obsidian	2	
Washington Pass chert	1	
Chinlee chert	2	
Grey chert	3	
White chert	3	
Quartzite	2	
Petrified wood	1	
Jemez obsidian	1	(Point fragment)

Comments: This structure was originally documented by Rory Gauthier and John R. Stein on the Gasco pipeline survey in the summer of 1976. At the time the issue of Chaco relatedness was a press-

ing one. That the Bonito style buildings were then recognized as probable public and administrative structures is illustrated in Gauthier's discussion on the Anasazi research potential (Gauthier et al. 1981) in the Gasco survey reports. Roads, however, were not then recognized as architectural forms common to the Bonito Phase. Tom Windes of the Chaco Center was then in the process of investigating stone circles in the Chaco Canyon Periphery. Although the Gasco Herradura did meet some of the criteria for a stone circle it certainly it wasn't anything that Chaco archeologists were comfortable with at the time. The Gasco Herradura is perhaps the largest and most formalized herradura currently known. Its presence in the Red Mesa Valley emphasizes the fact that roads were highly formalized on the periphery, perhaps even more so in some respects than on the Basin floor. The Gasco Herrandura is a very significant location and efforts should be made to insure its preservation.



GASCO HERRADURA

LA 14878

Recorded by John R. Stein
Daisy F. Levine
July 31, 1982

Blue "J" Ruin

LA Number: 18795

Other Numbers: None known

Recorder: Daisy F. Levine and John R. Stein; July 31, 1982

Temporal Affinity: A.D. 870 to 1250

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: None known

Topographic Situation: Structure is situated on a gentle slope at the base of the Red Cliffs.

Visible Horizon: Visibility from this structure is good, however the site location was not chosen with visibility as a primary criteria. Visibility is excellent in all directions save for the northeast where the view is blocked by the Red Cliffs. The most advantageous location for visibility would be several hundred meters to the east of this location where the landform on which this site is located crests.

Soil: Sandy loam

Vegetation: Grasses, saltbrush and juniper

Primary Drainage: Casamero Draw

Elevation: 6940'

Location:
Quad: Thoreau NE, 7.5 min., USGS (not plotted)
UTM: Zone 12 76912 E 3925240 N
Legal: T14N R11W SE/4SE/4 Section 18

Site Description: This structure appears to be a "J" shaped construction approximately eight by 10 meters in maximum dimensions. Walls utilize blocks and slabs of Todilto limestone in uniform coarse layers. Construction is compound and walls average .5 to .6 meters in thickness. At least two contiguous rooms are contained within the structural matrix, however damage to the structure by pothunting activity may obscure some architectural information. The mound is presently 1.5 meters in relief and a structure of only a single story is represented.

Kiva: A slight depression to the southeast of the structure suggests the presence of a subterranean kiva.

Swale: A slight swale which is ground-visible for a distance of 50 meters enters the site area on a bearing of approximately N295° and terminates some 30 meters from the structure. It is not currently known if this swale represents a prehistoric road.

Middens: A rather large midden 35 meters east-west by 15 meters north-south is located 26 meters southeast of the structure. The midden is shallow and is composed of construction spalls, ashy soil and artifacts. A second midden is located 13 meters east of the structure and measures roughly 12 by 12 meters. Depth is estimated at .5 meters. This midden appears to be primarily construction debris and possibly earth excavated from the roadway if such exists.

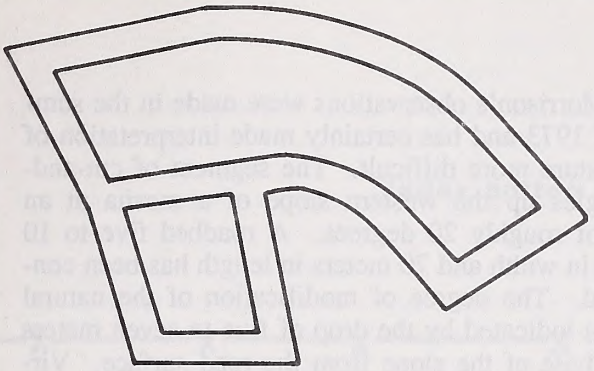
Ceramics (grab sample from midden area):

			Indeterminate
Cibola Gray Ware	**Jar**	**Bowl**	
Wide Banded	2		
Plain, coarse temper			1
Narrow Banded	3		
Corrugated, Medicine Style	6		
Corrugated, Tusayan Style	28		
Cibola White Ware			
Undiagnostic, coarse tempered	1		
Undiagnostic, fine tempered	9		
Red Mesa B/W	8	5	
Escavada B/W	2	3	
Gallup B/W	10	2	
Mesa Verde White Ware			
Mancos B/W	1		
Cortez B/W	1		
McElmo B/W		1	
White Mountain Red Ware			
Puerco B/R		1	

Lithics (grab sample from midden area):	**Frequency**
Grants obsidian	1
Chinlee chert	2
White chert	4
Quartzite	1

Comments: The Blue "J" ruin is thought to represent Bonito style architecture primarily due to the exaggerated relief of the rubble mound and the odd configuration of the structural elements. The ruin is a conspicuous aspect of the landscape and quite unlike the numerous other ruins in the vicinity which were not constructed in such a substantial manner. This ruin was documented primarily because it lay on a projected alignment west of the Gasco Her-

radura, about four kilometers distant. A swale appears to enter the site area but the evidence for a road is not conclusive. The presence of a rather large midden formation is not characteristic of road-related features and the possible kiva depression is further evidence that the structure may be more residential in function. Unfortunately this structure is located 50 meters from an active limestone quarry and 75 meters from a haul road. Pothunting activity has already damaged structural aspects of the site and it is likely that the ruin will be destroyed in the near future. Although the intended function of this ruin must remain problematic it is most likely that it represents a residential structure dating late in the Chaco sequence.



True North

Spalls

30.30 meters to swale
bearing 295°
Visible for approx.
50.0 meters

BLUE "J" RUIN
LA 18795

Recorded by John R. Stein
Daisy F. Levine
July 31, 1982

0 1 2 3 4 5 10

Scale-meters

Midden

South Road No. 24

LA Number: 34231

Temporal Affinity: This location appears to be an early 20th century wagon road superimposed over the alignment of the prehistoric South Road.

Cultural Affinity: Eastern Anasazi, historic Navajo-Anglo

Road Association: This location represents a segment of the prehistoric South Road Alignment.

Topographic Situation: Site is situated on the southern margin of the Kin Klizhin Valley.

Visible Horizon: Not applicable

Soil: Sandstone bedrock

Vegetation: Range grasses, saltbrush

Primary Drainage: Kin Klizhin Wash

Elevation: 6520'

Location:
Quad: Seven Lakes NW, 7.5 min., USGS (Map 8)
UTM: Zone 13 230079 E 3979036 N
Legal: T20N R11W NW/4NW/4SE/4 Section 34

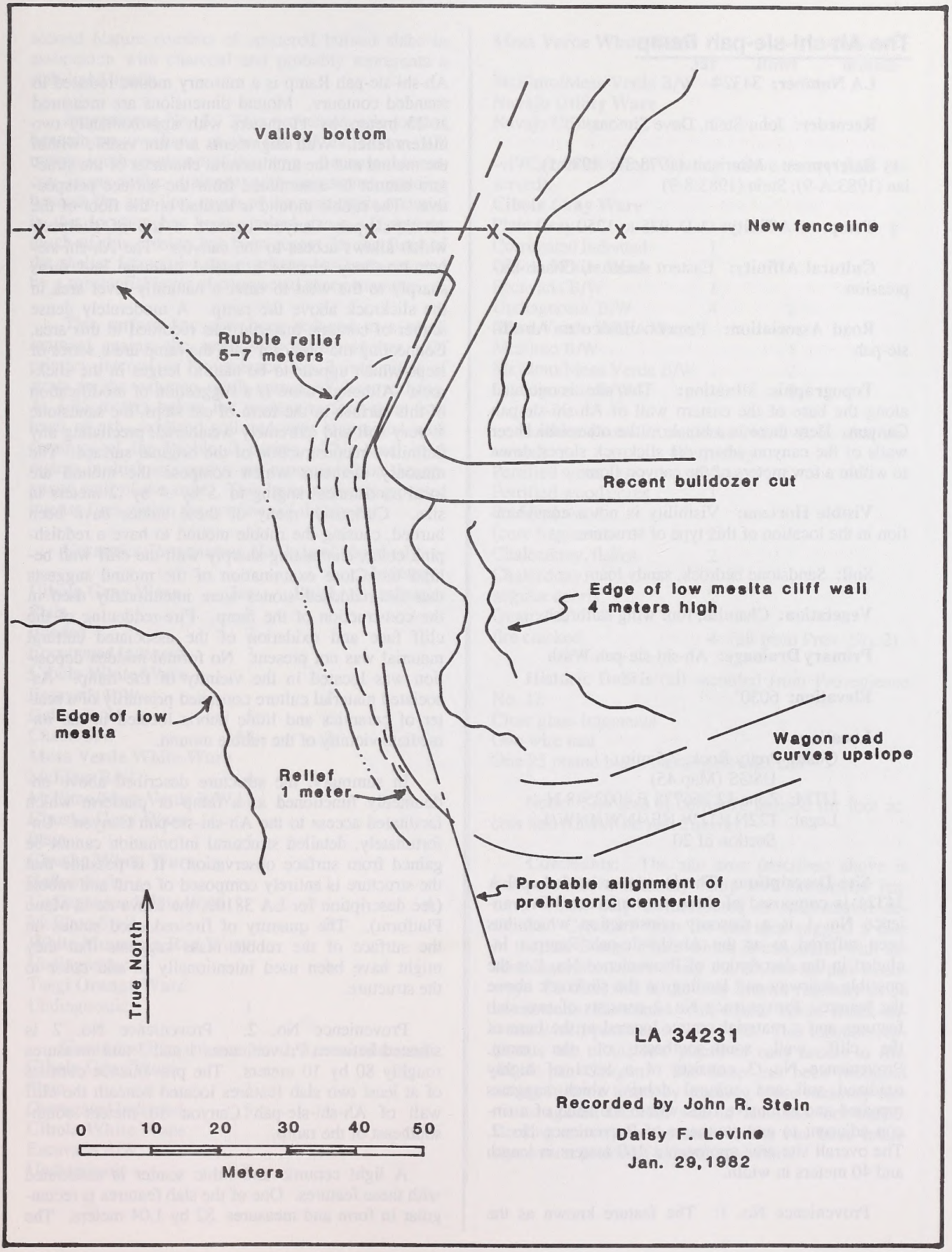
Site Description: LA 34231 has been described as an example of cut-and-fill construction on the South Road (Morrison 1973, 1979). At this location the prehistoric alignment began the final ascent to the crest of the southern margin of the Kin Klizhin Valley. Today this alignment appears to be coincident with two additional road alignments, one a turn-of-the-century wagon road and the second a recent bladed access to facilitate construction of a new fence line. Fence line construction has transpired since Morrison's observations were made in the summer of 1973 and has certainly made interpretation of this feature more difficult. The segment of cut-and-fill angles up the western slope of a mesita at an angle of roughly 20 degrees. A roadbed five to 10 meters in width and 70 meters in length has been constructed. The degree of modification of the natural slope is indicated by the drop of five to seven meters to the base of the slope from the road surface. Virtually the entire surface of this slope is covered by spoils from construction of the road.

Ceramics: One La Plata Black-on-white jar sherd was found within the right-of-way at the southern end of the segment.

Lithics: One flake of white chert was located at the base of the slope midway along the segment.

Historic: No material culture dating to the historic period was located in the vicinity of the segment.

Comments: After re-examination of this segment of the South Road, it was the judgment of the Phase I crew that it represented historic construction activity (Stein 1983:8-14). Material culture association was inconclusive, however an historic wagon road definitively coincided with the segment and could be easily seen curving off the east onto the top of the mesita. It is puzzling as to why such effort was expended to construct a wagon road along a steep slope when easier routes would seem to have been available here. In light of the otherwise unlikely coincidence of the prehistoric and historic right-of-way it may be the grade already existed and was easily modified and used for wagon traffic. Any prehistoric modification of the slope would be obscured by use and modification of the segment during historic times. It should be noted that historic use of this feature is not apparent in aerial photography taken by the Soil Conservation Service in the 1930s.


Valley bottom
New fenceline
Rubble relief
5-7 meters
Recent bulldozer cut
Edge of low mesita cliff wall
4 meters high
Edge of low
mesita
Wagon road
curves upslope
Relief
1 meter
Probable alignment of
prehistoric centerline
True North
0 10 20 30 40 50
Meters
LA 34231
Recorded by John R. Stein
Daisy F. Levine
Jan. 29,1982

The Ah-shi-sle-pah Ramp

LA Number: 34324

Recorder: John Stein, Dave Simons

References: Morrison (1973:34; 1979:1), Vivian (1983:A-9), Stein (1983:8-9)

Temporal Affinity: A.D. 925 to 1250

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: Penasco Blanco to Ah-shi-sle-pah

Topographic Situation: The site is situated along the base of the eastern wall of Ah-shi-sle-pah Canyon. Here there is a break in the otherwise sheer walls of the canyon where the slickrock slopes down to within a few meters of the canyon floor.

Visible Horizon: Visibility is not a consideration in the location of this type of structure.

Soil: Sandstone bedrock, sandy loam

Vegetation: Chamisa, four wing saltbrush

Primary Drainage: Ah-shi-sle-pah Wash

Elevation: 6030'

Location:
Quad: Pretty Rock, 7.5 min., USGS (Map 45)
UTM: Zone 12 766778 E 4002548 N
Legal: T22N R11W NE/4NW/4NW/4 Section of 20

Site Description: The location recorded as LA 34324 is composed of three proveniences. Provenience No. 1 is a masonry construction which has been referred to as the Ah-shi-sle-pah Ramp. Included in the description of Provenience No. 1 is the possible stairway and landing on the slickrock above the feature. Provenience No. 2 consists of two slab features and a material scatter located at the base of the cliff wall south-southeast of the ramp. Provenience No. 3 consists of a level of highly oxidized soil and cultural debris which suggests repeated and extensive fires within the head of a rincon adjacent to and southeast of Provenience No. 2. The overall site area approaches 160 meters in length and 40 meters in width.

Provenience No. 1: The feature known as the Ah-shi-sle-pah Ramp is a masonry mound reduced to rounded contours. Mound dimensions are measured at 23 meters by 11 meters with approximately two meters relief. Wall alignments are not visible within the mound and the architectural character of the structure cannot be assertained from the surface perspective. The rubble mound is located on the floor of the Ah-shi-sle-pah Canyon beneath a toe of slickrock which allows access to the canyon. The Ah-shi-sle-pah Roadway crosses a lateral drainage and turns sharply to the west to enter a naturally level area in the slickrock above the ramp. A moderately dense scatter of ceramic material was recorded in this area. Connecting the platform with the ramp are a series of steps which appear to be natural ledges in the slickrock. Although there is a suggestion of modification of this surface in the form of cut steps, the sandstone is very soft and extremely weathered, precluding any definitive reconstruction of the original surface. The masonry elements which compose the mound are local sandstones ranging to .5 by .4 by .2 meters in size. Curiously, many of these stones have been burned, causing the rubble mound to have a reddish-pink color, contrasting sharply with the cliff wall behind it. Close examination of the mound suggests that fire-reddened stones were intentionally used in the construction of the ramp. Fire-reddening of the cliff face and oxidation of the associated cultural material was not present. No formal midden deposition was located in the vicinity of the ramp. Associated material culture consisted primarily of a scatter of ceramics and lithic debris located in the immediate vicinity of the rubble mound.

In summary, the structure described above undoubtedly functioned as a ramp or platform which facilitated access to the Ah-shi-sle-pah Canyon. Unfortunately, detailed structural information cannot be gained from surface observation. It is possible that the structure is entirely composed of earth and rubble (see description for LA 38109, the Llave de la Mano Platform). The quantity of fire-reddened stones on the surface of the rubble mass suggests that they might have been used intentionally to add color to the structure.

Provenience No. 2: Provenience No. 2 is situated between Proveniences 1 and 3 and measures roughly 80 by 10 meters. The provenience consists of at least two slab features located beneath the cliff wall of Ah-shi-sle-pah Canyon 50 meters south-southeast of the ramp.

A light ceramic and lithic scatter is associated with these features. One of the slab features is rectangular in form and measures .82 by 1.04 meters. The

second feature consists of scattered burned slabs in association with charcoal and probably represents a slab-lined hearth.

Provenience No. 3: This provenience is located beneath an overhang at the end of the rincon 100 meters south-southeast of the ramp. Because this rincon is an active drainage with occasional ponding beneath the drip line, much of the prehistoric material in this location has been washed away. It appears much of this erosion has been recent for the floor of the shelter formed by the overhang has been covered by a substantial layer of compacted sheep manure.

This surface has now been reduced to a small remnant against the south wall of the shelter. Of primary interest in Provenience No. 3 is a pillar of strata in the extreme north corner of the overhang. At 1.25 meters below the present surface there is a level of ash, oxidized soil and clay intermixed with ceramics of the Pueblo II period. This level is .3 meters in thickness and is not represented on the opposite wall of the cave. This layer suggests repeated intense fires within the confines of the shelter.

Ceramics (Provenience No. 1, total observed):

	Jar	Bowl	Indeterminate
Cibola Gray Ware			
Plain	8		
Banded	2		
Corrugated Indented	3		
Cibola White Ware			
Escavada B/W		1	
Gallup B/W	5	2	
Chaco B/W	32	2	
Mesa Verde White Ware			
McElmo B/W	4	1	
McElmo/Mesa Verde B/W	12		
Chuska Gray Ware			
Plain	1		
Chuska White Ware			
Gallup Style		1	
Undiagnostic White Ware			4
McElmo Style		2	
White Mountain Red Ware			
Undiagnostic		1	
Tsegi Orange Ware			
Undiagnostic	1		

Ceramics (Provenience No. 2, 3, total observed):

Cibola Gray Ware			
Plain	1		
Corrugated Indented	5		
Cibola White Ware			
Escavada B/W	1		
Undiagnostic	2		
Mesa Verde White Ware			
McElmo/Mesa Verde B/W	4		
Navajo Utility Ware			
Navajo Utility	1		

Ceramics (from landing above ramp, total observed):

Cibola Gray Ware			
Plain Gray	1		1
Corrugated Indented	1		
Cibola White Ware			
Escavada B/W	1		
Undiagnostic B/W	4	2	
Mesa Verde White Ware			
McElmo B/W		1	
McElmo/Mesa Verde B/W	1	2	
Undiagnostic B/W		5	

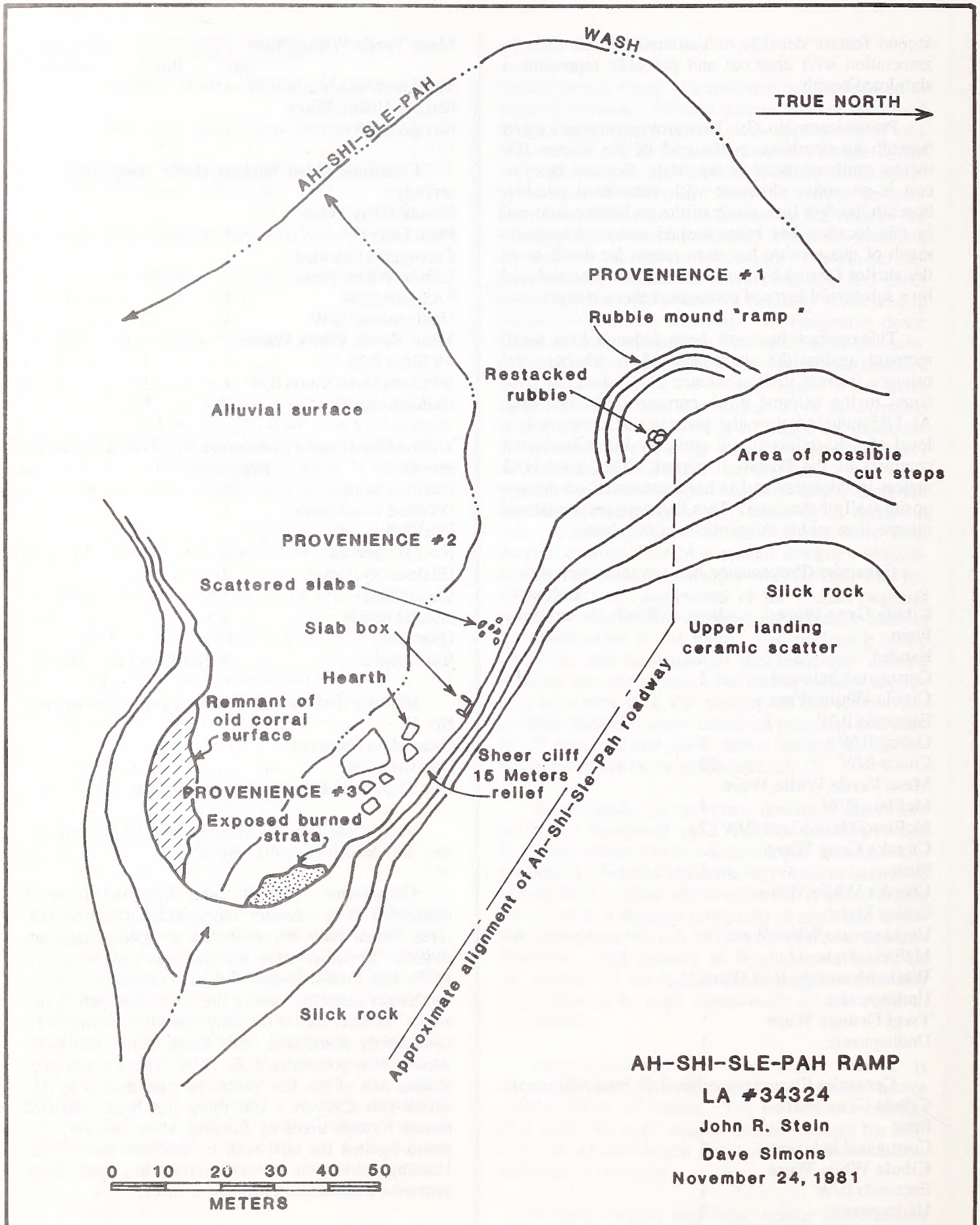
Lithics (from Provenience No. 1 & 2, total observed):

	Frequency	
Petrified wood	4	
Petrified wood cores	1	
Petrified wood, (core fragments	2	
Chalcedony, flakes	2	
Chalcedony, angular debris	2	
Quartzite, fire cracked	4	(all from Prov. No. 2)

Historic Debris (all recorded from Provenience No. 1):
Clear glass fragments
One wire nail
One 25 pound black blasting powder can

Note: Site area is currently utilized for foot access into Ah-shi-sle-pah Canyon.

Comments: The site area described above is composed of a masonry ramp and extramural features which may be attributed to road-related activities. Ceramics from the site area suggest a date in the late Bonito Phase which is consistent with assemblages elsewhere along the Ah-shi-sle-pah Roadway. To date, this is the only known roadway to be consistently associated with Mesa Verde Black-on-white which post dates A.D. 1150. This location represents one of the few places of easy access to Ah-shi-sle-pah Canyon. The ramp has been modified during historic times by stacking loose masonry elements against the cliff wall to facilitate foot traffic. Herding activity in the site vicinity has been intensive over a period of a century or more.



AH-SHI-SLE-PAH RAMP

LA #34324

John R. Stein

Dave Simons

November 24, 1981

Champignon (The Mushroom)

LA Number: 36639

Recorders: John R. Stein, Daisy F. Levine, David Simons

Temporal Affinity: Predominance of corrugated utility wares in association with solid and hatcher style white wares indicated a Pueblo II occupation date (A.D. 925 to 1125). Presence of St. John's Polychrome and Mesa Verde Black-on-white suggest that the structure on the top of the pinnacle represents a Pueblo III (A.D. 1200-1340) Mesa Verde Phase construction or modification and reuse of an existing Chacoan structure.

Cultural Affinity: Eastern Anasazi, Chaco and Mesa Verde Expressions

Road Association: Location is in close proximity to the projected alignment of Casa del Rio to Lake Valley Segment of the West Chaco Road.

Topographic Situation: Champignon is situated on an isolated badland pinnacle composed of sandstone caprock perched atop a clay pillar. The surface of the caprock stands 11.9 meters above the valley floor and is 20 by eight meters in maximum extent.

Visible Horizon: Juan's Lake area, Yellow Point Valley

Soil: Clay hardpan to sandy silt below sandstone cap of pinnacle

Vegetation: Vegetation is very sparse in the area. Grasses, sandsage and prickly pear on the top of pinnacle. Sparse grasses, greasewood and Russian thistle on the bottomland.

Primary Drainage: Yellow Point Valley, four kilometers southeast from the confluence with the Chaco River.

Elevation: 5980'

Location:
Quad: La Vida Mission 7.5 min. USGS (Map 41)
UTM: Zone 12 757460 E 3998180 N
Legal: T22N R12W NE/4NE/4SW/4 Section 32.

Site Description: Champignon consists of the remains of a masonry structure built atop a badland pillar (Provenience No. 1) and a series of rooms built at the base of the pillar (Provenience No. 2).

Provenience No. 1: The upper structure is evidenced by standing masonry walls constructed of slabs and blocks of dark brown sandstone derived from local sources. An elongated structure 14 meters by eight meters contains six irregular cells, the largest of which is four by six meters and the smallest two by 2.5 meters.

Walls are composed of simple to compound masonry and average 35 to 40 centimeters in thickness. Maximum standing wall height is 1.5 meters. Crude abutments suggest accretionary growth. Features within the rooms are lacking and portions of the structure may have collapsed and fallen from the mesa top. Entry to the upper structure is apparently gained via an access on the southwestern edge of the mesa cap. Collapsed masonry in this area indicated that the access was formalized, perhaps for defensive purposes.

Provenience No. 2: The lower structure consists of four contiguous rooms constructed at the base of the pinnacle 11.9 meters below the upper structure on the southern side of the feature. Construction of these rooms appears to differ markedly from that of the upper structure in that the lower rooms are much larger; three by three to 2.5 by 4.5 meters. The rooms exhibit a more uniform rectangular layout and are much more massive, indicating compound construction. However, these rooms are reduced to a low mound with wall alignments only partially visible. Depth of fill may be substantial, perhaps 50 centimeters or more.

Middens: A midden and rubble scatter 20 meters northeast-southwest by 15 meters northwest-southeast is located to the south of the lower house. Sherd density is low with 63 pieces in a 15 by 15 meter area (approximately .3 sherds per square meter).

Ceramics:

Cibola Gray Ware:	**Jar**	**Bowl**	**Indeterminate**
Plain	2		2
Banded	1		
Corrugated Indented	19		
Cibola White Ware			
Escavada B/W	1	1	
Gallup B/W	4		
Mesa Verde White Ware			
McElmo B/W	1	1	
Undiagnostic	2	2	
Mesa Verde B/W			1

			Indeter-
Chuska Gray Wares	**Jar**	**Bowl**	**minate**
Plain			1
Corrugated Indented	18		
Chuska White Wares			
Undiagnostic	1		
White Mountain Red Ware			
St. John's Polychrome		1	

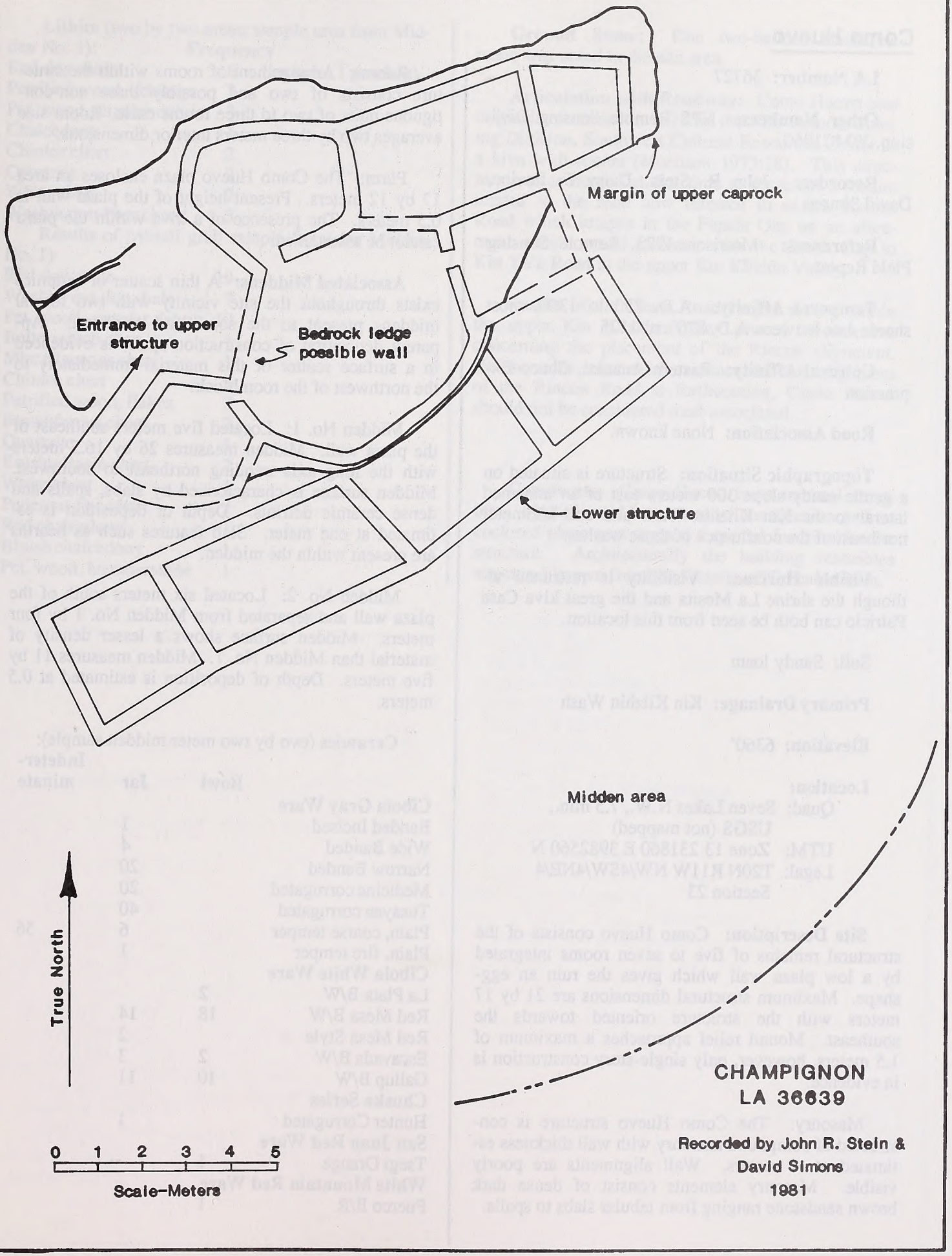
Lithics (sample area equals 225 square meters):	**Frequency**
Petrified wood	3
Butterscotch chert	1

Historic Debris: Casual use of the site area by local residents and children has resulted in the deposition of some contemporary artifacts. These include articles of clothing, a burlap bag, fragments of a Seven-Up soda bottle, a steel soda can and an alarm clock.

Site Condition: The site is located in the immediate environs of a contemporary Navajo residence. The surrounding area has been denuded of vegetation and is actively eroding. Casual use of the site area has resulted in minor surface disturbance and historic litter (broken glass etc.). Access to the upper structure is difficult enough to discourage most visitation. Local children have, however, used the structure as a fort or playhouse.

Comments: Champignon is located very near to the projected alignment of the Casa del Rio to Lake Valley segment of the West Road. The structure was originally investigated because of the possibility that it might represent a road-related construction, albeit an unusual one. Several aspects of the structure suggested a road-related function: 1) the large massive construction; 2) the shrine-like character of the upper structure, e.g. massively constructed small, irregular cells in an elevated situation; 3) the unique character of the location, level with but separated from the projected roadway seems unlikely to be coincidental; and 4) the low sherd density, a characteristic of small road-related buildings.

Ceramic assemblages documented for Champignon indicate that while the lower structure dates solidly to the late Pueblo II period, the upper structure contained ceramics manufactured after the Chaco collapse. Further, the architecture of the upper structure resembles that of other Mesa Verde Phase sites in the Basin floor, e.g. Mesa Pueblo, Mesa Tierra. There are, in fact, two construction or use eposides represented at Champignon.



CHAMPIGNON
LA 36639

Recorded by John R. Stein &
David Simons
1981

Como Huevo

LA Number: 36727

Other Numbers: NPS Remote Sensing Division, 29MC1860

Recorder: John R. Stein, Daisy F. Levine, David Simons

References: Morrison 1973, Remote Sensing Field Report

Temporal Affinity: A.D. 750 to 1300, most sherds date between A.D. 870 and 1125

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: None known.

Topographic Situation: Structure is situated on a gentle sandy slope 300 meters east of an unnamed lateral to the Kin Klizhin Wash and one kilometer northeast of the confluence of those washes.

Visible Horizon: Visibility is restricted although the shrine La Mesita and the great kiva Casa Patricio can both be seen from this location.

Soil: Sandy loam

Primary Drainage: Kin Klizhin Wash

Elevation: 6360'

Location:
Quad: Seven Lakes N.W., 7.5 min., USGS (not mapped)
UTM: Zone 13 231860 E 3982560 N
Legal: T20N R11W NW/4SW/4NE/4 Section 23

Site Description: Como Huevo consists of the structural remains of five to seven rooms integrated by a low plaza wall which gives the ruin an egg-shape. Maximum structural dimensions are 21 by 17 meters with the structure oriented towards the southeast. Mound relief approaches a maximum of 1.5 meters, however, only single-story construction is in evidence.

Masonry: The Como Huevo structure is constructed of compound masonry with wall thickness estimated at .4 meters. Wall alignments are poorly visible. Masonry elements consist of dense dark brown sandstone ranging from tabular slabs to spalls.

Rooms: Arrangement of rooms within the structure consists of two and possibly three non-contiguous units of two to three rooms each. Room size averages two by three meters interior dimensions.

Plaza: The Como Huevo plaza encloses an area 17 by 12 meters. Present height of the plaza wall is 0.5 meters. The presence of a kiva within the plaza cannot be assertained.

Associated Middens: A thin scatter of ceramics exists throughout the site vicinity with two formal middens present to the south and southeast. Apparent deposition of construction spalls is evidenced in a surface scatter of this material immediately to the northwest of the roomblock.

Midden No. 1: Located five meters southeast of the plaza wall. Midden measures 26 by 16.5 meters with the long axis trending northeast to southwest. Midden surface is characterized by slabs, spalls and dense ceramic detritus. Depth of deposition is estimated at one meter. Slab features such as hearths are present within the midden.

Midden No. 2: Located six meters south of the plaza wall and separated from Midden No. 1 by four meters. Midden surface shows a lesser density of material than Midden No. 1. Midden measures 11 by five meters. Depth of deposition is estimated at 0.5 meters.

Ceramics (two by two meter midden sample):

	Bowl	Jar	Indeterminate
Cibola Gray Ware			
Banded Incised		1	
Wide Banded		4	
Narrow Banded		20	
Medicine corrugated		20	
Tusayan corrugated		40	
Plain, coarse temper		6	56
Plain, fire temper		1	
Cibola White Ware			
La Plata B/W	2		
Red Mesa B/W	18	14	
Red Mesa Style		2	
Escavada B/W	2	3	
Gallup B/W	10	11	
Chuska Series			
Hunter Corrugated		1	
San Juan Red Ware			
Tsegi Orange	1		
White Mountain Red Ware			
Puerco B/R	1		

Lithics (two by two meter sample area from Midden No. 1):

	Frequency	
Red dog shale	6	(includes 1 pendant)
Petrified wood, debitage	3	
Pet. wood, angular debris	3	
Chalcedony	1	
Chinlee chert	2	
Quartzite	2	
White chert	2	
Washington Pass chert	3	

Results of overall grab sample (total for Midden No. 1)

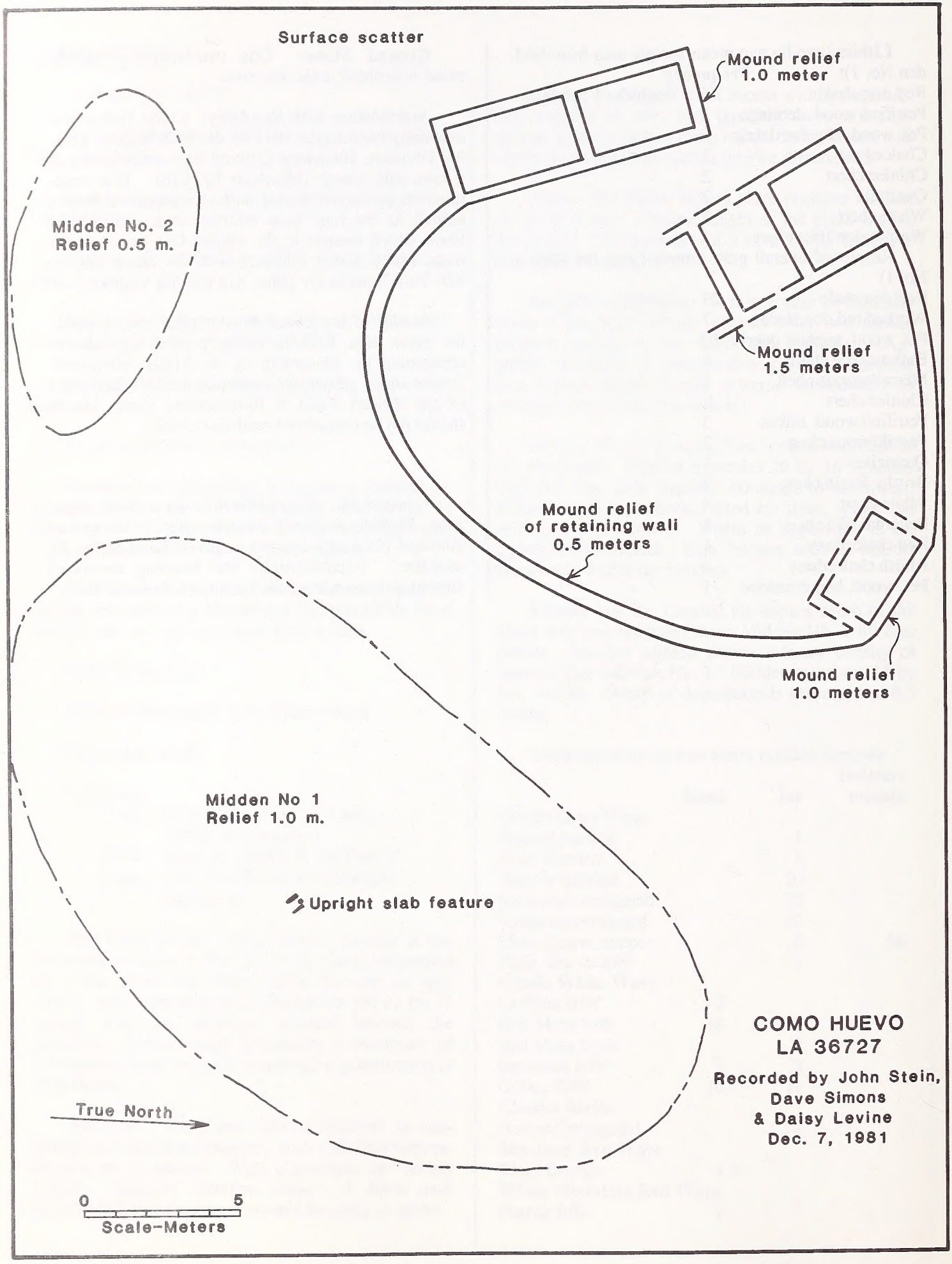
Red dog shale	29
Worked red dog shale	7
Pet. wood, angular debris	10
Butterscotch chert	1
Miscellaneous chert	1
Chinlee chert	9
Petrified wood, flakes	3
Fossiliferous chert	2
Quartzite	1
Brushy Basin chert	2
White chert	4
Pedernal-like chert	2
Red chalcedony	1
Bluish chalcedony	1
Pet. wood, hammerstone	1

Ground Stone: One two-handed sandstone mano was noted in the site area.

Articulation with Roadway: Como Huevo was originally recorded in 1973 by the NPS Remote Sensing Division, Southwest Cultural Resources Center as a kiva with rooms (Morrison 1973:18). This structure was presumed at that time to represent a feature related to the road now referred to as the Rincon Road which images in the Fajada Gap on an alignment which would intersect with the South Gap to Kin Ya'a Road in the upper Kin Klizhin Valley.

Results of the Chaco Road Project survey within the upper Kin Klizhin Valley proved inconclusive concerning the placement of the Rincon alignment. Unless more substantial evidence for this alignment of the Rincon Road is forthcoming, Como Huevo should not be considered road-associated.

Comments: Como Huevo is an unusual structure. Multiple middens, massive construction and an enclosed plaza area suggest a special function for the structure. Architecturally the building resembles structures known from the vicinity of Greenlee Ruin.



COMO HUEVO
LA 36727

Recorded by John Stein,
Dave Simons
& Daisy Levine
Dec. 7, 1981

Seven Lakes Herradura; Structure A

LA Number: 38104

Other Numbers: None known

Recorders: John R. Stein, Daisy F. Levine

Temporal Affinity: A.D. 800 to 1250

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: South Road. Projection of imaged segments of the South Road suggest that the alignment passes immediately west of the structure. A constructed segment of the South Road is located 50 meters to the north and is approximately 100 meters in length.

Topographic Situation: Structure A is perched at the margin of a major topographic break which drops sharply to the south into Seven Lakes Wash. The structure is approximately centered in a gap 400 meters in width which is flanked by low sandstone outcrops. The situation of this structure is most dramatic if approached from the south.

Visible Horizon: To the north and west the edge of Chacra Mesa above Fajada Butte and Tse Ka-a are visible. To the south Hosta Butte, Heart Rock, Satan Pass, Wheatgrass Pass, and Borrego pass are visible.

Soil: Shallow sandy mantle over clay substrate

Vegetation: Sandsage, grasses, and ephedra

Primary Drainage: Seven Lakes Wash

Elevation: 6590'

Location:
Quad: Becenti Lake Quad, 7.5 min., USGS (Map 6)
UTM: Zone 12 769670 E 3973100 N
Legal: T19N R11W NE/4NW/4 Section 21

Site Description:
Shape: Oval
Dimensions: 5.5 by 4.0 meters
Orientation: Slightly east of north.

Structure A is reduced to a low mound with up to four courses of masonry standing to 0.3 meters. Rubble is scattered about in the vicinity of the structure, particularly downslope to the south. Mass of the rubble concentration suggests that the walls were never more than one meter in height and that the structure was not roofed. Walls are of simple construction utilizing unshaped sandstone elements ranging from spalls to massive slabs .5 by .4 by .05 meters in size.

Material Culture: No formal midden deposition was noted in association with the structure. A relatively sparse scatter of ceramic debris is concentrated in an 80 meter north-south by 30 meter east-west area centered on the structure.

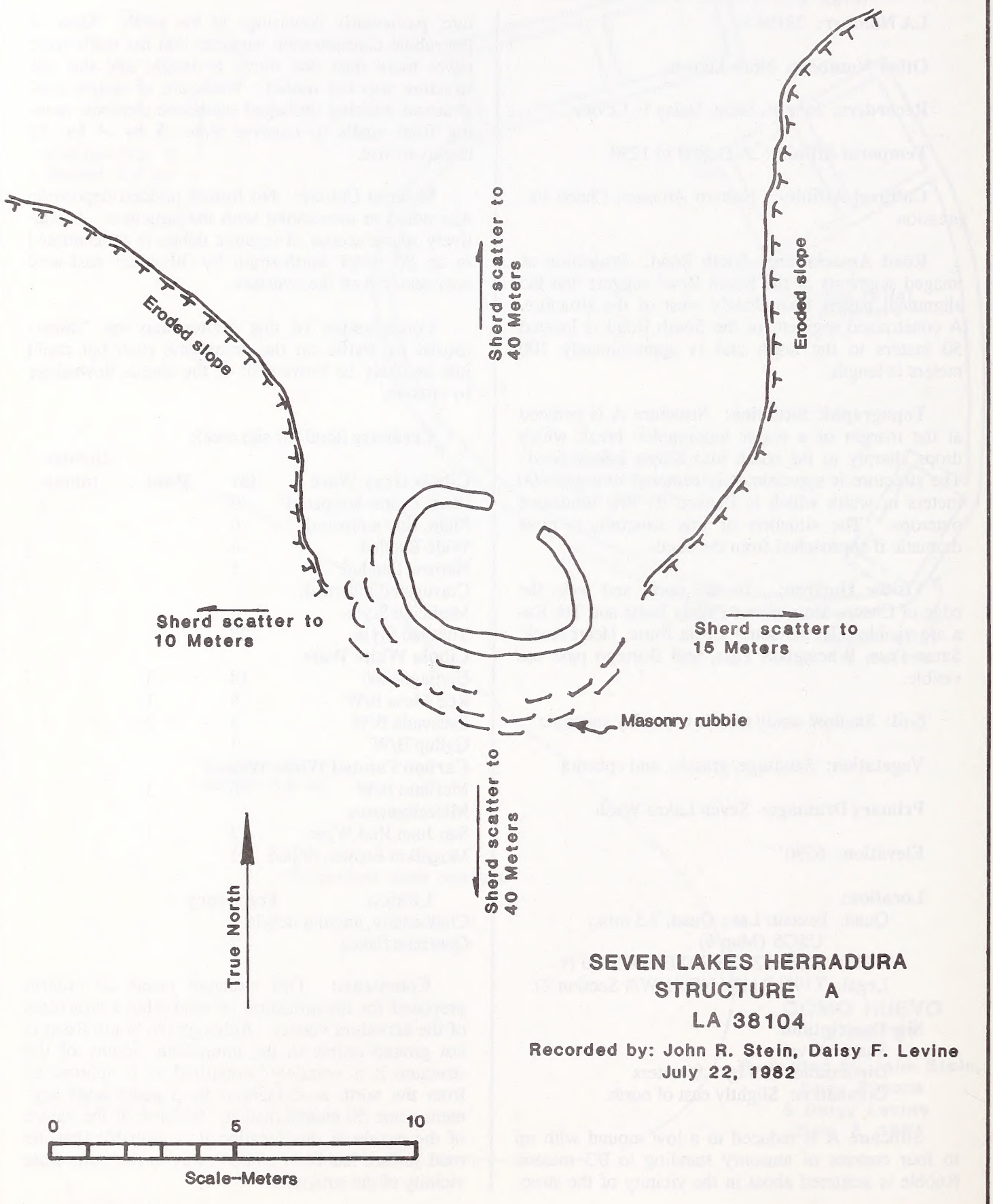
Configuration of this scatter may be "smear" caused by traffic on the prehistoric road but could just as likely be movement of the sherds downslope by erosion.

Ceramics (total for site area):

Cibola Gray Ware	**Jar**	**Bowl**	**Indeterminate**
Plain, coarse tempered	6		2
Plain, fine tempered	6		
Wide Banded	4		
Narrow Banded	5		
Corrugated Indented, Medicine Style	4		
Tusayan Style	28		
Cibola White Ware			
Undiagnostic	18	3	
Red Mesa B/W	8	1	
Escavada B/W	4	2	
Gallup B/W	3		
Carbon Painted White Ware			
McElmo B/W	6	3	
Miscellaneous			
San Juan Red Ware	2	1	
Mogollon Brown, ribbed	1		

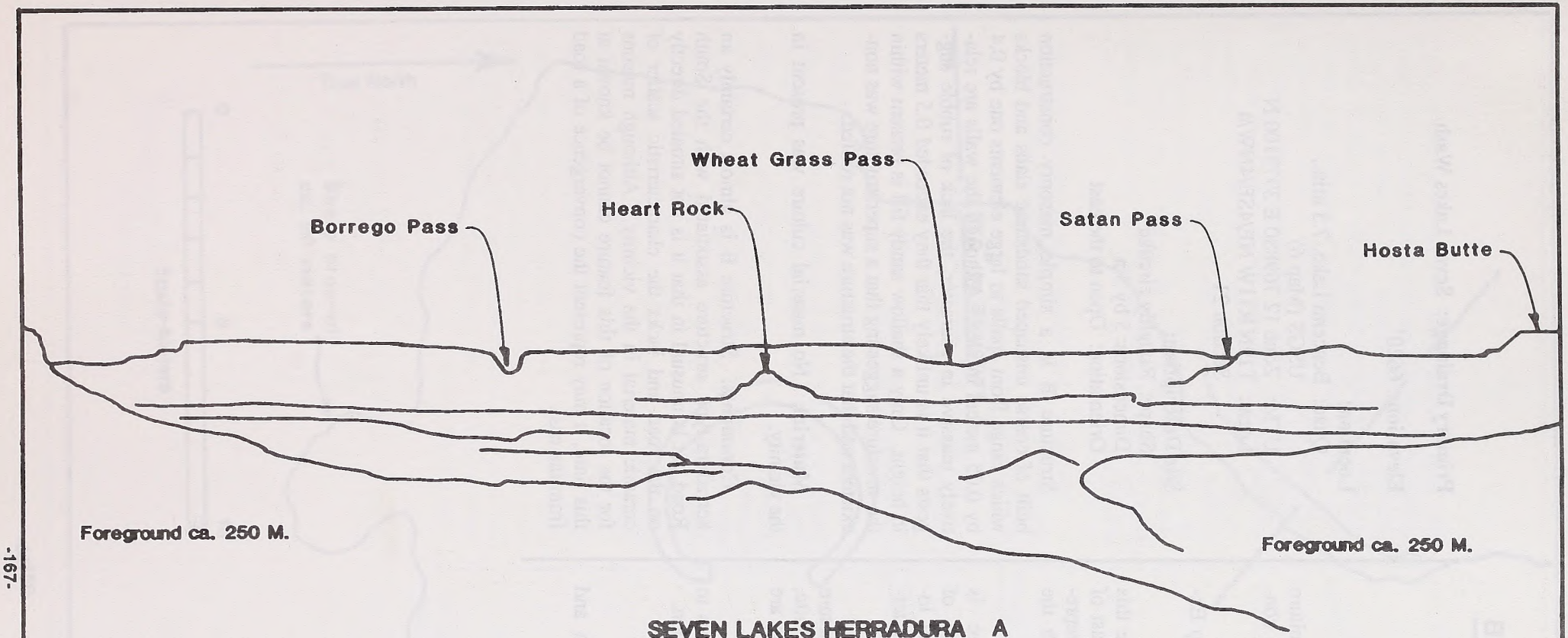
Lithics:	**Frequency**
Chalcedony, angular debris	1
Quartzite flakes	2

Comments: This structure meets all criteria proposed for identification of road-related structures of the herradura variety. Although the South Road is not ground-visible in the immediate vicinity of the structure it is certainly formalized as it approaches from the north as evidenced by a constructed segment some 50 meters distant. Because of the nature of the terrain at this location it is probable that the road surface has been eroded away in the immediate vicinity of the structure.



SEVEN LAKES HERRADURA
STRUCTURE A
LA 38104

Recorded by: John R. Stein, Daisy F. Levine
July 22, 1982



SEVEN LAKES HERRADURA A
LA 38104
VIEW TO SOUTH

Seven Lakes Herradura; Structure B

LA Number: 38105

Other Numbers: None known

Recorders: John R. Stein, Daisy F. Levine

Temporal Affinity: Associated material culture is lacking, however the structure appears to be contemporaneous with Structure A.

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: South Road. Because this structure is located approximately 140 meters east of the South Road alignment it is possible that it represents the presence of a road converging with the South Road from the east.

Topographic Situation: The structure is situated on a narrow flat-topped peninsula of sandstone bedrock which is elevated above and located 140 meters N270° from Structure A. The terrain drops off sharply to the south of this feature.

Visible Horizon: Visibility from this structure is excellent, particularly to the south. Hosta Butte, Satan Pass, Borrego Pass, and Wheatgrass Pass are visible.

Bee Burrow, which is located 2.9 kilometers to the south-southwest, is not visible from this location.

Soil: Sandstone bedrock

Vegetation: Grasses, sandsage, saltbrush and snakeweed are common in the vicinity.

Primary Drainage: Seven Lakes Wash

Elevation: 6620'

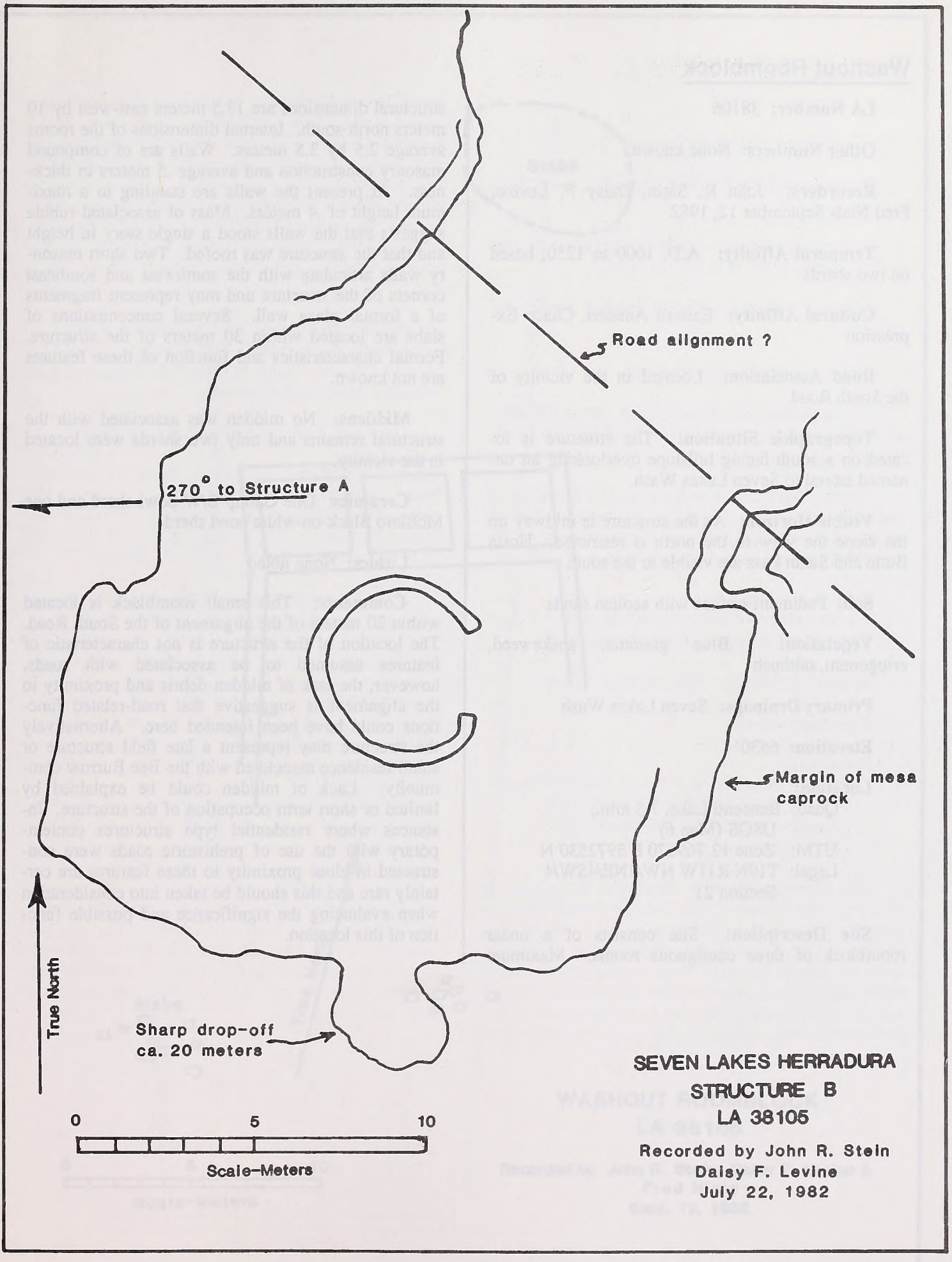
Location:
Quad: Bencenti Lake, 7.5 min., USGS (Map 6)
UTM: Zone 12 769880 E 3973100 N
Legal: T19N R11W NE/4SE/4NW/4 Section 21

Site Description:
Shape: Roughly circular
Dimensions: 5 by 5m
Orientation: Open to the east

Structure B is a simple masonry construction built of coarse unshaped sandstone slabs and blocks which range from spalls to large elements one by 0.4 by 0.05 meters in size. Although the walls are relatively massive in character, the lack of rubble suggests that it is unlikely that they exceeded 0.5 meters in height. Only a shallow sandy fill is present within the structure suggesting that a superstructure was nonexistent and that the structure was not roofed.

Material: No material culture was present in the vicinity.

Comments: Structure B is almost certainly an herradura-type structure associated with the South Road. It is unusual in that it is not situated directly on the road and lacks the characteristic scatter of ceramic material in the vicinity. Although reasons for the location of this feature cannot be known at this time, it may represent the convergence of a road from the east.


Road alignment ?
270° to Structure A
Margin of mesa caprock
True North
Sharp drop-off ca. 20 meters
0
5
10
Scale-Meters
SEVEN LAKES HERRADURA
STRUCTURE B
LA 38105
Recorded by John R. Stein
Daisy F. Levine
July 22, 1982

Washout Roomblock

LA Number: 38106

Other Numbers: None known

Recorders: John R. Stein, Daisy F. Levine, Fred Nials September 12, 1982

Temporal Affinity: A.D. 1000 to 1250, based on two sherds

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: Located in the vicinity of the South Road.

Topographic Situation: The structure is located on a south-facing hillslope overlooking an unnamed lateral to Seven Lakes Wash.

Visible Horizon: As the structure is midway up the slope the view to the north is restricted. Hosta Butte and Satan Pass are visible to the south.

Soil: Pediment surface with aeolian sands

Vegetation: Blue gramma, snakeweed, eriogonum, saltbush

Primary Drainage: Seven Lakes Wash

Elevation: 6530'

Location:
Quad: Bencenti Lake, 7.5 min., USGS (Map 6)
UTM: Zone 12 769570 E 3972530 N
Legal: T19N R11W NW/4NE/4SW/4 Section 21

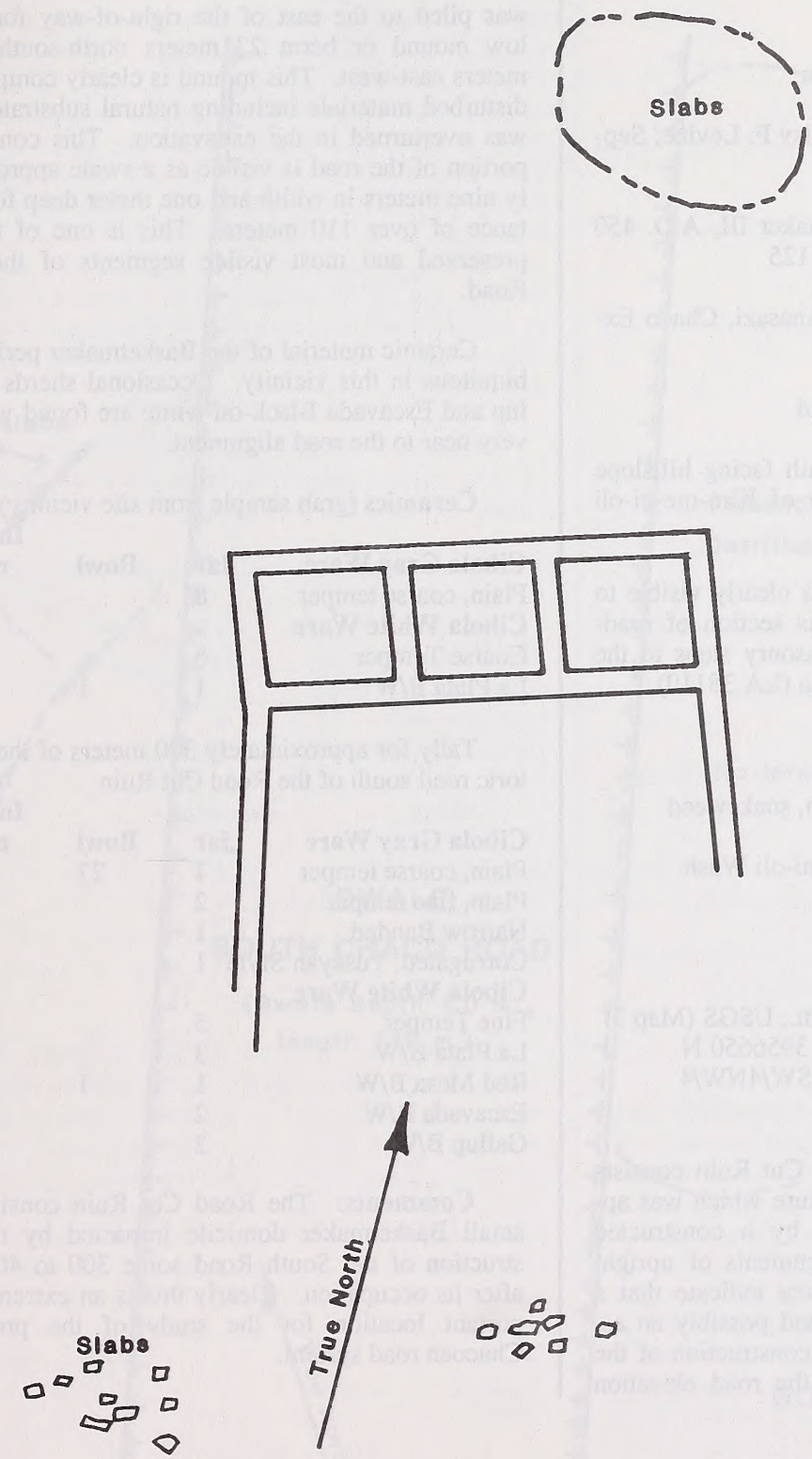
Site Description: Site consists of a linear roomblock of three contiguous rooms. Maximum structural dimensions are 13.5 meters east-west by 10 meters north-south. Internal dimensions of the rooms average 2.5 by 3.5 meters. Walls are of compound masonry construction and average .5 meters in thickness. At present the walls are standing to a maximum height of .4 meters. Mass of associated rubble suggests that the walls stood a single story in height and that the structure was roofed. Two short masonry walls articulate with the southwest and southeast corners of the structure and may represent fragments of a formal plaza wall. Several concentrations of slabs are located within 30 meters of the structure. Formal characteristics and function of these features are not known.

Middens: No midden was associated with the structural remains and only two sherds were located in the vicinity.

Ceramics: One Gallup B/W bowl sherd and one McElmo Black-on-white bowl sherd

Lithics: None noted

Comments: This small roomblock is located within 20 meters of the alignment of the South Road. The location of the structure is not characteristic of features assumed to be associated with roads, however, the lack of midden debris and proximity to the alignment is suggestive that road-related functions could have been intended here. Alternatively the structure may represent a late field structure or small residence associated with the Bee Burrow community. Lack of midden could be explained by limited or short term occupation of the structure. Instances where residential type structures contemporary with the use of prehistoric roads were constructed in close proximity to these features are certainly rare and this should be taken into consideration when evaluating the significance and possible function of this location.



WASHOUT ROOMBLOCK
LA 38106

Recorded by John R. Stein, Daisy F. Levine & Fred Nials
Sept. 12, 1982

Road Cut Ruin

LA Number: 38107

Other Numbers: None known

Recorders: John R. Stein, Daisy F. Levine; September 23, 1982

Temporal Affinity: Basketmaker III, A.D. 450 to 875; Pueblo II-III, A.D. 925 to 1125

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: South Road

Topographic Situation: South facing hillslope overlooking an unnamed tributary of Kim-me-ni-oli Wash

Visible Horizon: Kin Ya'a is clearly visible to the south-southwest. Visually this section of roadway appears to align with the masonry steps to the upper platform at Llave de La Mano (LA 38110).

Soil: Sandy loam

Vegetation: Grasses, saltbrush, snakeweed

Primary Drainage: Kim-me-ni-oli Wash

Elevation: 6680'

Location:
Quad: Heart Rock, 7.5 min., USGS (Map 3)
UTM: Zone 12 763350 E 3956650 N
Legal: T17N R12W NE/4SW/4NW/4
Section 11

Site Description: The Road Cut Ruin consists of a small Basketmaker slab structure which was apparently impacted prehistorically by a constructed portion of the South Road. Alignments of upright slabs in a four by eight meter area indicate that a small arc of jacal surface rooms and possibly an associated pit structure were cut by construction of the prehistoric road. Material from the road elevation was piled to the east of the right-of-way forming a low mound or berm 22 meters north-south by 11 meters east-west. This mound is clearly composed of disturbed materials including natural substrate which was overturned in the excavation. This constructed portion of the road is visible as a swale approximately nine meters in width and one meter deep for a distance of over 110 meters. This is one of the best preserved and most visible segments of the South Road.

Ceramic material of the Basketmaker period is ubiquitous in this vicinity. Occasional sherds of Gallup and Escavada Black-on-white are found within or very near to the road alignment.

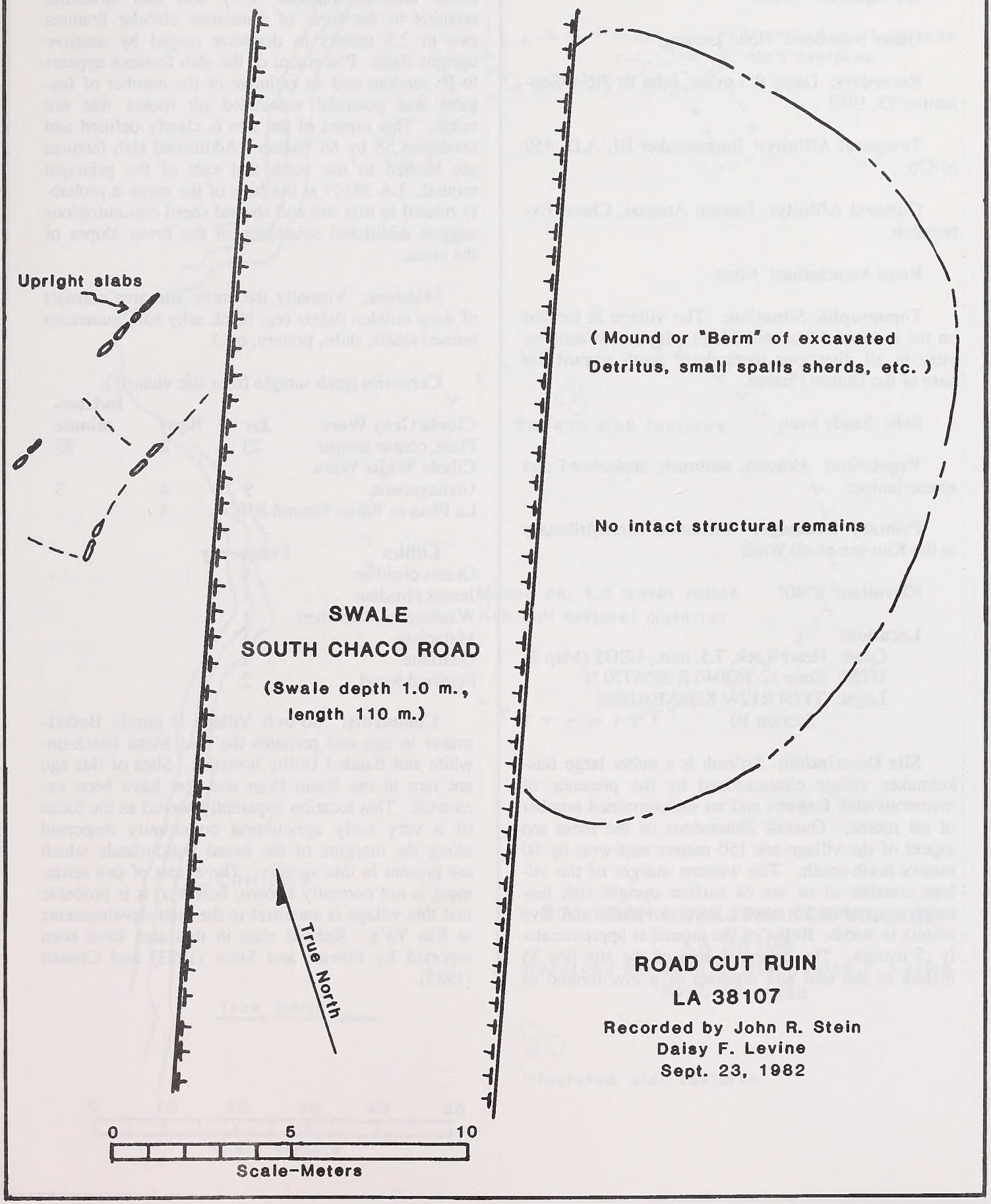
Ceramics (grab sample from site vicinity):

Cibola Gray Ware	**Jar**	**Bowl**	**Indeterminate**
Plain, coarse temper	8		10
Cibola White Ware			
Coarse Temper	6		3
La Plata B/W	1	1	

Tally for approximately 300 meters of the prehistoric road south of the Road Cut Ruin

Cibola Gray Ware	**Jar**	**Bowl**	**Indeterminate**
Plain, coarse temper	7	27	
Plain, fine temper	2		
Narrow Banded	1		
Corrugated, Tusayan Style	1		
Cibola White Ware			
Fine Temper	5		
La Plata B/W	3		
Red Mesa B/W	1	1	
Escavada B/W	2		
Gallup B/W	2		

Comments: The Road Cut Ruin consists of a small Basketmaker domicile impacted by the construction of the South Road some 300 to 400 years after its occupation. Clearly this is an extremely important location for the study of the prehistoric Chacoan road system.



ROAD CUT RUIN

LA 38107

Recorded by John R. Stein
Daisy F. Levine
Sept. 23, 1982

So'tsoh Basketmaker Village

LA Number: 38108

Other Numbers: None known

Recorders: Daisy F. Levine, John R. Stein; September 23, 1982

Temporal Affinity: Basketmaker III, A.D. 450 to 875

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: None

Topographic Situation: The village is located on the crest of a low mesa/ridge with a commanding view in all directions particularly south toward the base of the Dutton Plateau.

Soil: Sandy loam

Vegetation: Grasses, saltbrush, snakeweed and sparse juniper

Primary Drainage: Unnamed lateral/tributary to the Kim-me-ni-oli Wash

Elevation: 6780'

Location:
Quad: Heart Rock, 7.5. min., USGS (Map 3)
UTM: Zone 12 763040 E 3956770 N
Legal: T17N R12W SE/4NE/4NE/4
Section 10

Site Description: So'tsoh is a rather large Basketmaker village characterized by the presence of numerous slab features and an undetermined number of pit rooms. Overall dimensions of the mesa top aspect of the village are 150 meters east-west by 60 meters north-south. The western margin of the village consists of an arc of surface upright slab features measuring 50 meters north to south and five meters in width. Relief of the mound is approximately .5 meters. The principal area of the site lies 35 meters to the east and consists of a low mound of dense cultural material, ashy soil and structural remains in the form of numerous circular features two to 2.5 meters in diameter ringed by massive upright slabs. Placement of the slab features appears to be random and an estimate of the number of features and potential associated pit rooms was not made. This aspect of the site is clearly defined and measured 55 by 65 meters. Additional slab features are located to the north and east of the principal mound. LA 38107 at the base of the mesa is probably related to this site and several sherd concentrations suggest additional structures on the lower slopes of the mesa.

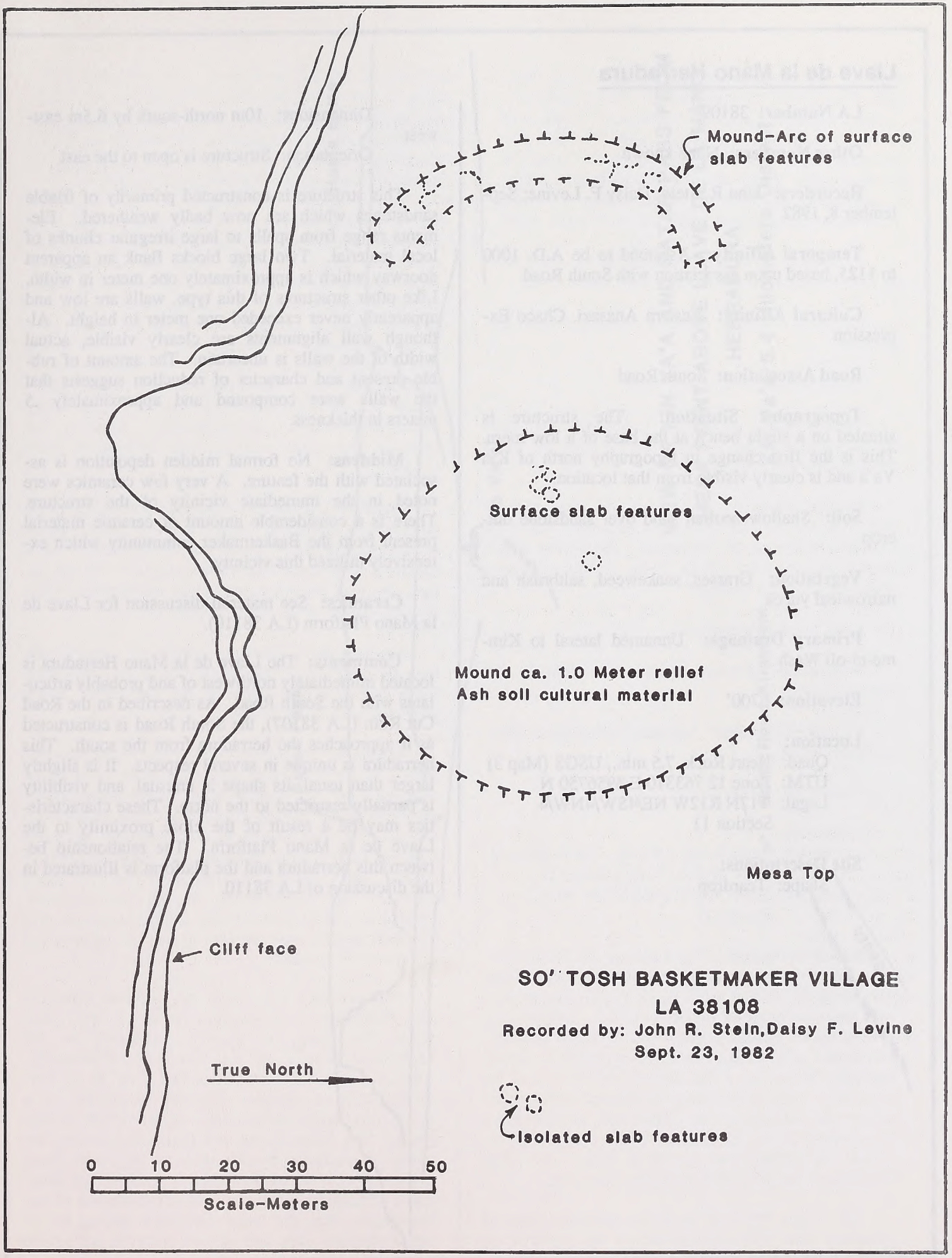
Middens: Virtually the entire site area consists of deep midden debris (eg. black ashy soil, numerous burned spalls, slabs, pottery, etc.).

Ceramics (grab sample from site vicinity):

Cibola Gray Ware	**Jar**	**Bowl**	**Indeterminate**
Plain, coarse temper	23	2	35
Cibola White Ware			
Undiagnostic	9	4	3
La Plata or White Mound B/W		3	

Lithics	**Frequency**
Grants obsidian	5
Jemez obsidian	1
Washington Pass chert	1
Malachite	1
Quartzite	1
Petrified wood	2

Comments: So'tsoh Village is purely Basketmaker in age and predates the Red Mesa Black-on-white and Banded Utility horizons. Sites of this age are rare in the Basin floor and few have been excavated. This location apparently served as the focus of a very early agricultural community dispersed along the margins of the broad bottomlands which are present in this vicinity. The extent of this settlement is not currently known, however, it is probable that this village is ancestral to the later developments at Kin Ya'a. Related sites in this area have been reported by Fowler and Stein (1983) and Gossett (1982).


Mound-Arc of surface slab features
Surface slab features
Mound ca. 1.0 Meter relief
Ash soil cultural material
Mesa Top
Cliff face
True North
0 10 20 30 40 50
Scale-Meters
SO' TOSH BASKETMAKER VILLAGE
LA 38108
Recorded by: John R. Stein, Daisy F. Levine
Sept. 23, 1982
Isolated slab features

Llave de la Mano Herradura

LA Number: 38109

Other Numbers: None known

Recorders: John R. Stein, Daisy F. Levine; September 8, 1982

Temporal Affinity: Assumed to be A.D. 1000 to 1125, based upon association with South Road

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: South Road

Topographic Situation: The structure is situated on a slight bench at the base of a low mesa. This is the first change in topography north of Kin Ya'a and is clearly visible from that location.

Soil: Shallow aeolian sand over sandstone outcrop

Vegetation: Grasses, snakeweed, saltbrush and narrowleaf yucca

Primary Drainage: Unnamed lateral to Kim-me-ni-oli Wash

Elevation: 6700'

Location:
Quad: Heart Rock, 7.5 min., USGS (Map 3)
UTM: Zone 12 763310 E 3956750 N
Legal: T17N R12W NE/4SW/4NW/4
Section 11

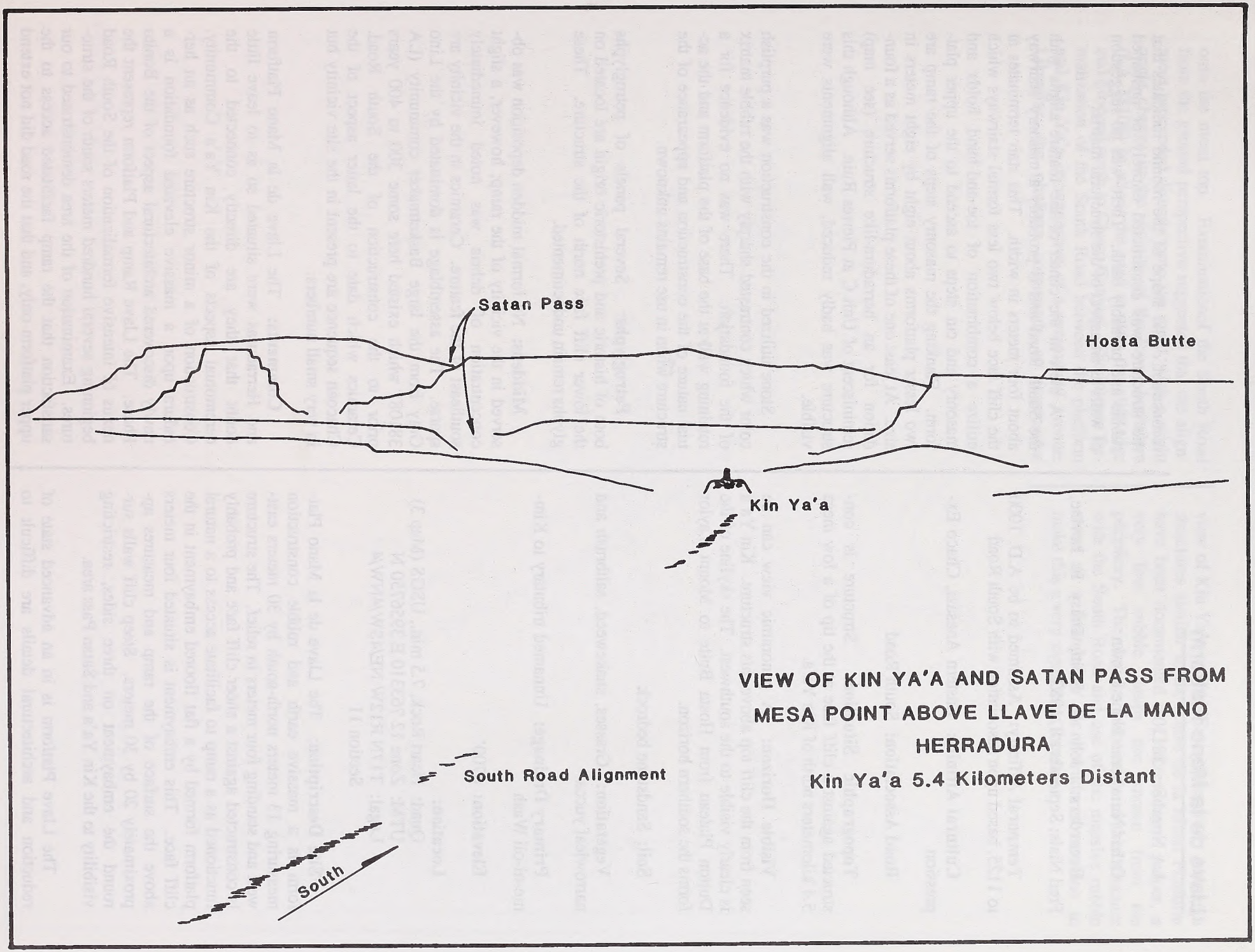
Site Descriptions:
Shape: Teardrop
Dimensions: 10m north-south by 6.5m east-west
Orientation: Structure is open to the east

This structure is constructed primarily of friable sandstones which are now badly weathered. Elements range from spalls to large irregular chunks of local material. Two large blocks flank an apparent doorway which is approximately one meter in width. Like other structures of this type, walls are low and apparently never exceeded one meter in height. Although wall alignments are clearly visible, actual width of the walls is uncertain. The amount of rubble present and character of reduction suggests that the walls were compound and approximately .5 meters in thickness.

Middens: No formal midden deposition is associated with the feature. A very few ceramics were noted in the immediate vicinity of the structure. There is a considerable amount of ceramic material present from the Basketmaker community which extensively utilized this vicinity.

Ceramics: See material discussion for Llave de la Mano Platform (LA 38110).

Comments: The Llave de la Mano Herradura is located immediately northwest of and probably articulates with the South Road. As described in the Road Cut Ruin (LA 38107), the South Road is constructed as it approaches the herradura from the south. This herradura is unique in several respects. It is slightly larger than usual, its shape is unusual, and visibility is partially restricted to the north. These characteristics may be a result of the close proximity to the Llave de la Mano Platform. The relationship between this herradura and the platform is illustrated in the discussion of LA 38110.



VIEW OF KIN YA'A AND SATAN PASS FROM
MESA POINT ABOVE LLAVE DE LA MANO
HERRADURA
Kin Ya'a 5.4 Kilometers Distant

Llave de la Mano Platform

LA Number: 38110

Other Numbers: None known

Recorders: John R. Stein, Daisy F. Levine, Fred Nials; September 8, 1982

Temporal Affinity: Assumed to be A.D. 1000 to 1125, based upon association with South Road

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: South Road

Topographic Situation: Structure is constructed against a cliff face at the tip of a low mesa 5.4 kilometers north of Kin Ya'a.

Visible Horizon: A panoramic view can be seen from the cliff top above this structure. Kin Ya'a is clearly visible to the southwest. The skyline of the Dutton Plateau from Hosta Butte to Mount Taylor forms the southern horizon.

Soil: Sandstone bedrock

Vegetation: Grasses, snakeweed, saltbrush and narrowleaf yucca

Primary Drainage: Unnamed tributary to Kim-me-ni-oli Wash

Elevation: 6700'

Location:
Quad: Heart Rock, 7.5 min., USGS (Map 3)
UTM: Zone 12 763310 E 3956750 N
Legal: T17N R12W NE/4SW/4NW/4 Section 11

Site Description: The Llave de la Mano Platform is a massive earth and rubble construction measuring 13 meters north-south by 30 meters east-west and standing four meters in relief. The structure is constructed against a sheer cliff face and probably functioned as a ramp to facilitate access to a natural platform formed by a flat floored embayment in the cliff face. This embayment is situated four meters above the surface of the ramp and measures approximately 20 by 30 meters. Steep cliff walls surround the embayment on three sides, restricting visibility to the Kin Ya'a and Satan Pass area.

The Llave Platform is in an advanced state of reduction and architectural details are difficult to reconstruct. The shape of the mound indicates that the structure was constructed entirely of unshaped rubble and probably earth. There was no suggestion of walls as an aspect of the structural matrix.

A cleft in the center of the feature aligns with the South Road and is probably a masonry stairway about four meters in width. This stair terminates at the cliff face below two less formal stairways which utilize a combination of toe-and-hand holds and masonry and cut steps to ascend to the upper platform. Flanking the masonry steps of the ramp are two lesser platforms about eight by eight meters in size. At least one of these platforms served as a foundation for an herradura-like structure (see map) reminiscent of Unit C at Pierres Ruin. Although this structure was badly reduced, wall alignments were visible.

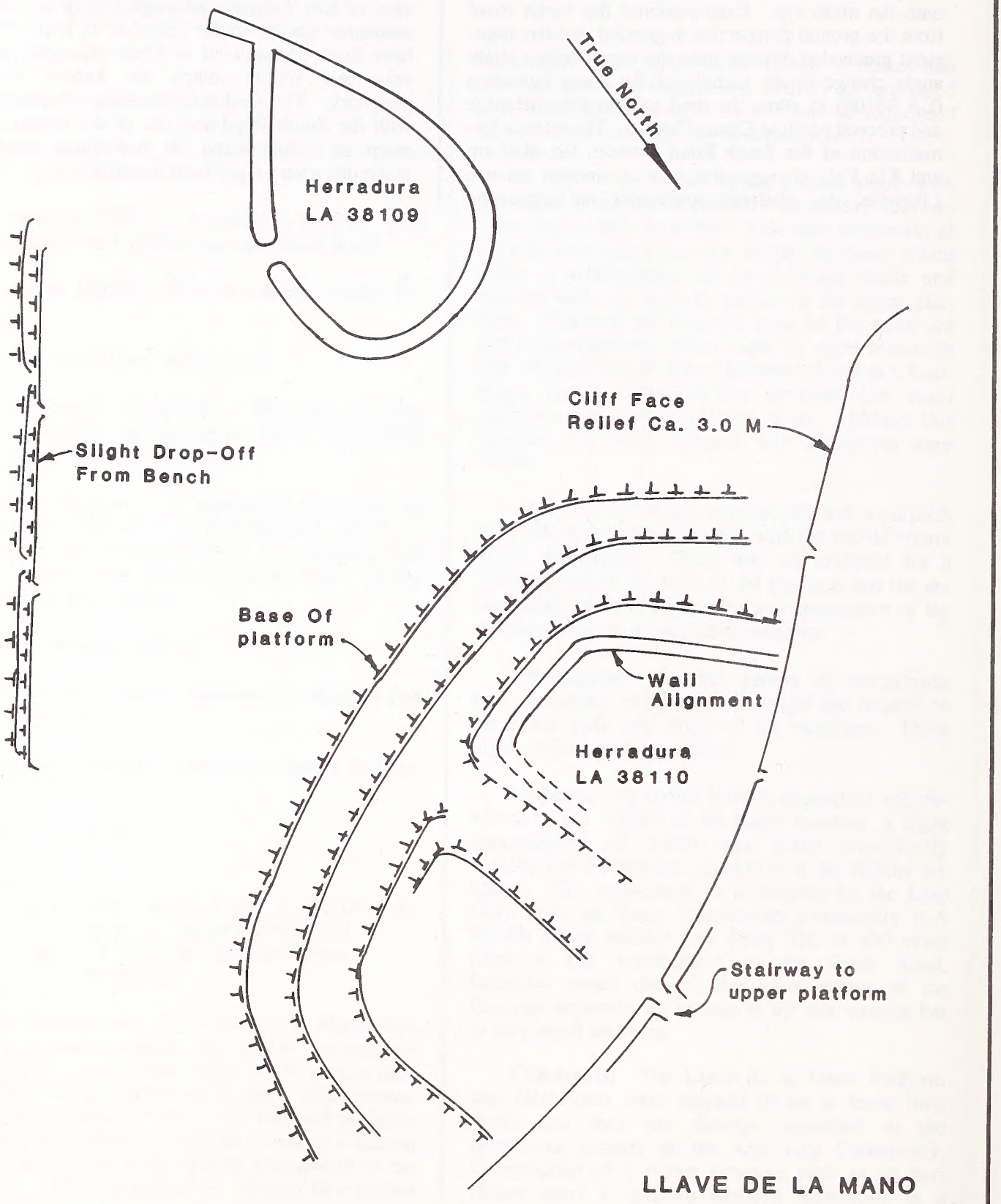
Stone utilized in the construction was a purplish color which contrasted sharply with the rubble matrix of the foundation. There was no evidence for a retaining wall at the base of the platform and the actual nature of the construction and appearance of the structure when in use remains unknown.

Petroglyphs: Several panels of petroglyphs both of historic and prehistoric origin are located on the lower cliff face north of the structure. These glyphs remain undocumented.

Middens: No formal midden deposition was observed in the vicinity of the ramp; however, a slight concentration of debris was noted immediately southeast of the feature. Ceramics in the vicinity are sparse. The assemblage is dominated by the Lino Gray from the large Basketmaker community (LA 38108) which existed here some 300 to 400 years prior to the construction of the South Road. Ceramics which date to the latter aspect of the Chacoan sequence are present in the site vicinity but in very small numbers.

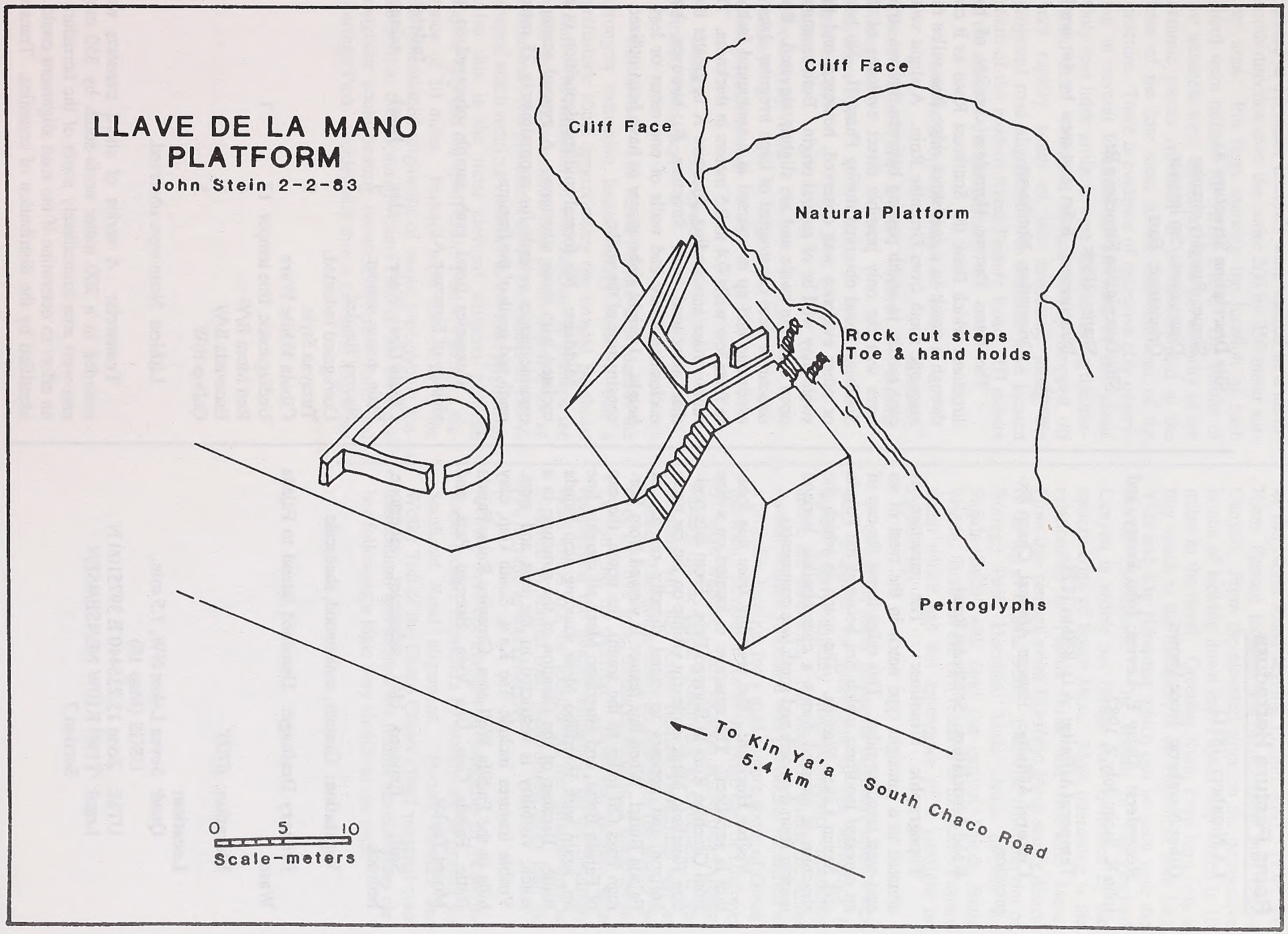
Comments: The Llave de la Mano Platform and Herraduras were situated so as to leave little doubt that they are directly connected to the ceremonial aspects of the Kin Ya'a Community. Construction of a minor structure such as an herradura upon a massive elevated foundation is a newly discovered architectural aspect of the Bonito Phase. The Llave Ramp and Platform represent the nexus of intensive formalization of the South Road beginning several hundred meters south of the structures. Examination of the area demonstrated to our satisfaction that the ramp facilitated access to the upper platform only, and that the road did not extend

onto the mesa top. Examinationof the South Road from the ground perspective suggested that the alignment proceeded directly onto the ramp, with a slight angle change in the vicinity of the lower herradura (LA 38109) to allow the road to skirt the cliff edge and proceed north to Chaco Canyon. The intense formalization of the South Road between the platform and Kin Ya'a is suggestive of a ceremonial avenue. Likewise, the platform commands an impressive view of Kin Ya'a and the Satan Pass area. Although structures similar to the Llave de la Mano Platform have been documented in Chaco Canyon proper, a very few rubble ramps are known from the periphery. The obvious association of this structure with the South Road and use of the massive rubble ramp as a foundation for herraduras combine to make this a very significant location.



LLAVE DE LA MANO
PLATFORM LA 38110

John R. Stein, Daisy F. Levine,
Fred Nials
Sept. 8, 1982


LLAVE DE LA MANO
PLATFORM
John Stein 2-2-83
Cliff Face
Cliff Face
Natural Platform
Rock cut steps
Toe & hand holds
Petroglyphs
To Kin Ya'a
5.4 km
South Chaco Road
0 5 10
Scale-meters

Rams Pasture Herradura

LA Number: 38111

Other Numbers: None known

Recorders: Daisy F. Levine, John Roney, and John R. Stein; July 2, 1982

Temporal Affinity: A.D. 870 to 1125

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: Southeast Road

Topographic Situation: The structure is situated in a gunsight type notch in the crest of an east-west trending ridge. This ridge forms the cap of an elevated landform which lies between the Fajada and Seven Lakes Washes. The notch in which the structure is situated forms a characteristic horizon marker from the north and south (see comments).

Visible Horizon: The visibility from this location is excellent. The structure is located on a line from Greenlee Ruin to Borrego Pass. From this position Huerfano Mesa is clearly visible on the far north horizon and appears to stand directly on top of Fajada Butte! When this feature is viewed from Borrego Pass (20 miles to the south), the notch, the cap of Fajada Butte, and Huerfano Mesa all roughly line up, again with Huerfano Mesa standing atop Fajada Butte. Because of the situation of the structure in a notch, visibility is restricted to the east and west. Visible features include Tse Ka'a, South Gap, clay hills in the Padilla Well area, Greenlee Ruin, Fajada Butte, Fajada Gap, Una Vida, Borrego Pass, and Mount Taylor.

Soil: Exposed clay substrates, sandstone, bedrock

Vegetation: Grasses, snakewood, shadscale

Primary Drainage: Unnamed lateral to Fajada Wash

Elevation: 6700'

Location:
Quad: Seven Lakes NW, 7.5 min., USGS (Map 16)
UTM: Zone 13 235440 E 3975100 N
Legal: T19N R10W NE/4SE/4SE/4 Section 7

Site Description Structure A:
Shape: Roughly circular
Dimensions: 5m interior
Orientation: East

Site Description Structure B:
Shape: Hook
Dimensions: 6.5m east-west by 4m north-south
Orientation: Northwest

The Rams Pasture Herradura consists of two structures which flank the Southeast Road as it cuts through a notch in a sandstone ridge four miles due magnetic south from Greenlee Ruin. A slight swale nine meters in width passing between the two structures was the only possible direct evidence of the Southeast Road observed during Phase II. No berm or other evidence was observed, however, and this swale may well be of natural origin. Both structures open onto the swale and are slightly elevated. Both structures were constructed of large irregular slabs of sandstone laid up or coursed in a compound fashion to form low walls 0.4 to 0.5 meters in thickness. The rubble mass surrounding Structure A is greater than that associated with Structure B, however, both enclosures likely had walls of one meter or less in height. Upright slabs appear to have been utilized in construction of the walls.

Middens: No formal midden deposition is associated with these structures. A general scatter of ceramic pieces extends for approximately 25 meters north and south of the features.

Ceramics (total grab sample observed in the vicinity of Structure A):

Cibola Gray Ware:	**Jar**	**Bowl**	**Indeterminate**
Plain, coarse temper	2		
Narrow Banded	1		
Corrugated Indented, Tusayan Style	9		
Cibola White Ware			
Undiagnostic, fine temper	17	1	
Red Mesa B/W	4		
Escavada B/W	5		
Gallup B/W	5		

Lithics: None were observed.

Transects: A series of sherd transects were recorded in a 200 meter north-south by 350 meter east-west area immediately south of the herradura in an effort to determine if the road alignment could be identified by the distribution of ceramics. Transects

spaced at 10 meter intervals were walked in a north-south direction over the entire 200 by 350 meter survey area. Pin flags marking the location of each sherd were utilized for visual effect. The results of the transects were inconclusive as the majority of the ceramic pieces appeared to be concentrated at the base of the low mesa to the east-southeast of the structure. There is evidence of extensive clay quarrying in several locations at the base of this mesa. Only four lithic artifacts were documented in the transected area. Material culture density dropped off very rapidly south of the structures, along the projected road alignment. No artifacts were located south of the modern Rams Pasture Road, 100 meters to the south of the herradura.

Ceramics (from the transected area):

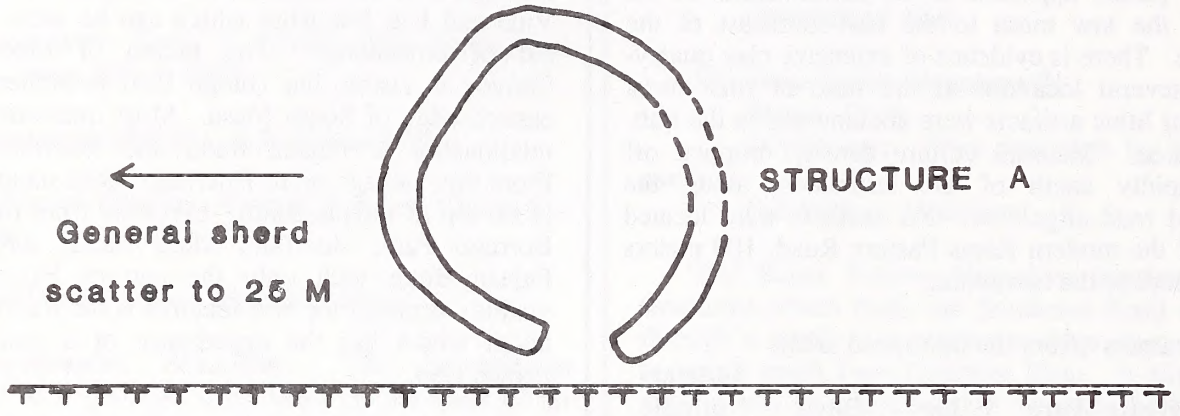
Cibola White Ware	**Jar**	**Bowl**	**Indeterminate**
Undiagnostic	11	1	
Red Mesa B/W	1		
Escavada B/W	3	3	
Gallup B/W	2		
Cibola Gray Ware			
Banded	2		
Corrugated, indented	8		

Lithics	**Frequency**
Petrified wood/chert	4

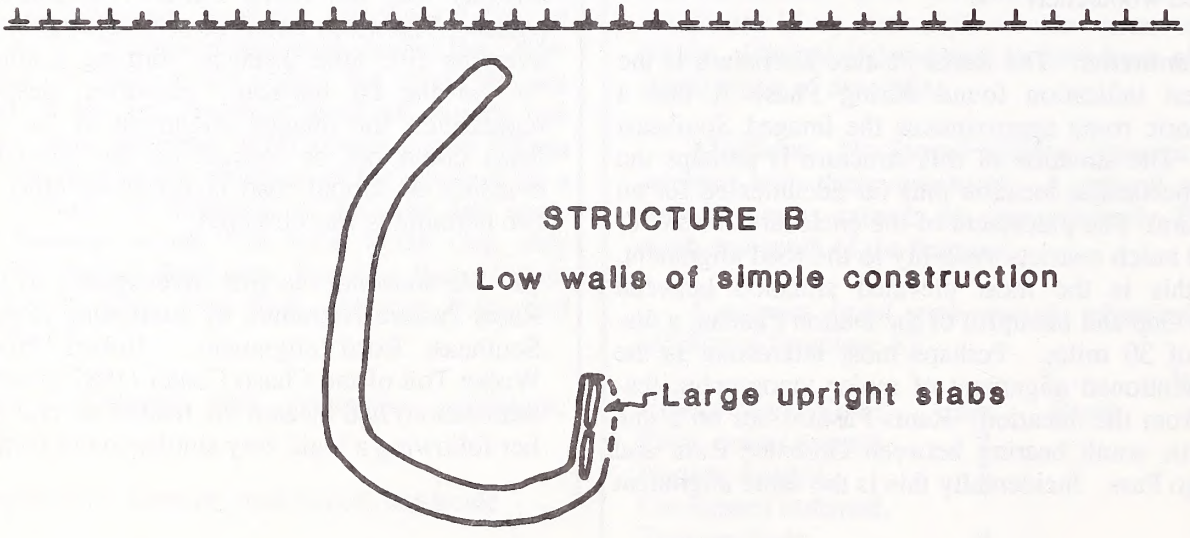
Comments: The Rams Pasture Herradura is the strongest indication found during Phase II that a prehistoric route approximates the imaged Southeast Road. The situation of this structure is perhaps the most spectacular location thus far documented for an herradura. The placement of the enclosures in the V-shaped notch restricts visibility to the road alignment. Also this is the most elevated situation between Fajada Gap and the uplift of the Dutton Plateau, a distance of 30 miles. Perhaps most interesting is the aforementioned alignment of major topographic features from this location. Rams Pasture lies on a due magnetic south bearing between Greenlee Ruin and Borrego Pass. Incidentally this is the same alignment as the North Road leaving Pueblo Alto. From the Rams Pasture location one looks north into Chaco Canyon. From the elevated situation the perspective is one of looking down into Fajada Gap which is 10 miles to the north. Greenlee Ruin, from here only a tiny speck in the distance, is on alignment with Una Vida and Kin Nahasbas which can be seen with the aid of binoculars. The mouth of Mockingbird Canyon is visible but Hungo Pavi is hidden by the eastern edge of South Mesa. Most interesting is the relationship of Fajada Butte and Huerfano Mesa. From this vantage point Huerfano Mesa stands directly on top of Fajada Butte. Likewise from the rim of Borrego Pass, Huerfano Mesa stands directly on Fajada Butte with only the cap of Fajada Butte visible. Beneath the two features is the Rams Pasture notch which has the appearance of a gunsight on Fajada Gap.

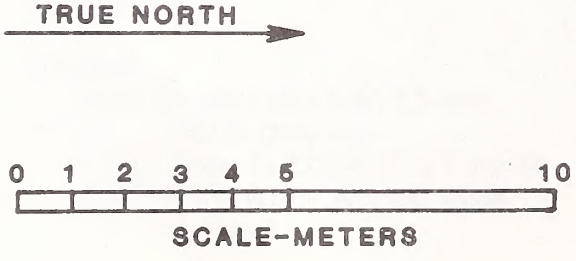
Given the many thousands of square miles which were available for placement of the herradura it seems highly unlikely that alignments mentioned above are fortuitous. The ridge on which the Rams Pasture feature is located was previously identified as a probable location for a road feature south of Greenlee Ruin. Several miles of the ridge east of Highway 57 were walked. This location is the only Anasazi feature on the ridge. Returning to Greenlee, it was obvious why the Rams Pasture Herradura was so placed. The notch could be seen with the naked eye over the five mile distance, forming a conspicuous "V" in the far horizon. However, despite these regularities, the imaged alignment of the Southeast Road could not be located on the ground and no evidence of formal road construction other than the two herraduras was observed.

We were not the first investigators to locate the Rams Pasture Herradura by attempting to project the Southeast Road alignment. Robert Powers and Wolky Toll of the Chaco Center (1982 personal communication) had located the feature several years earlier following a logic very similar to our own.



Swale - prehistoric alignment

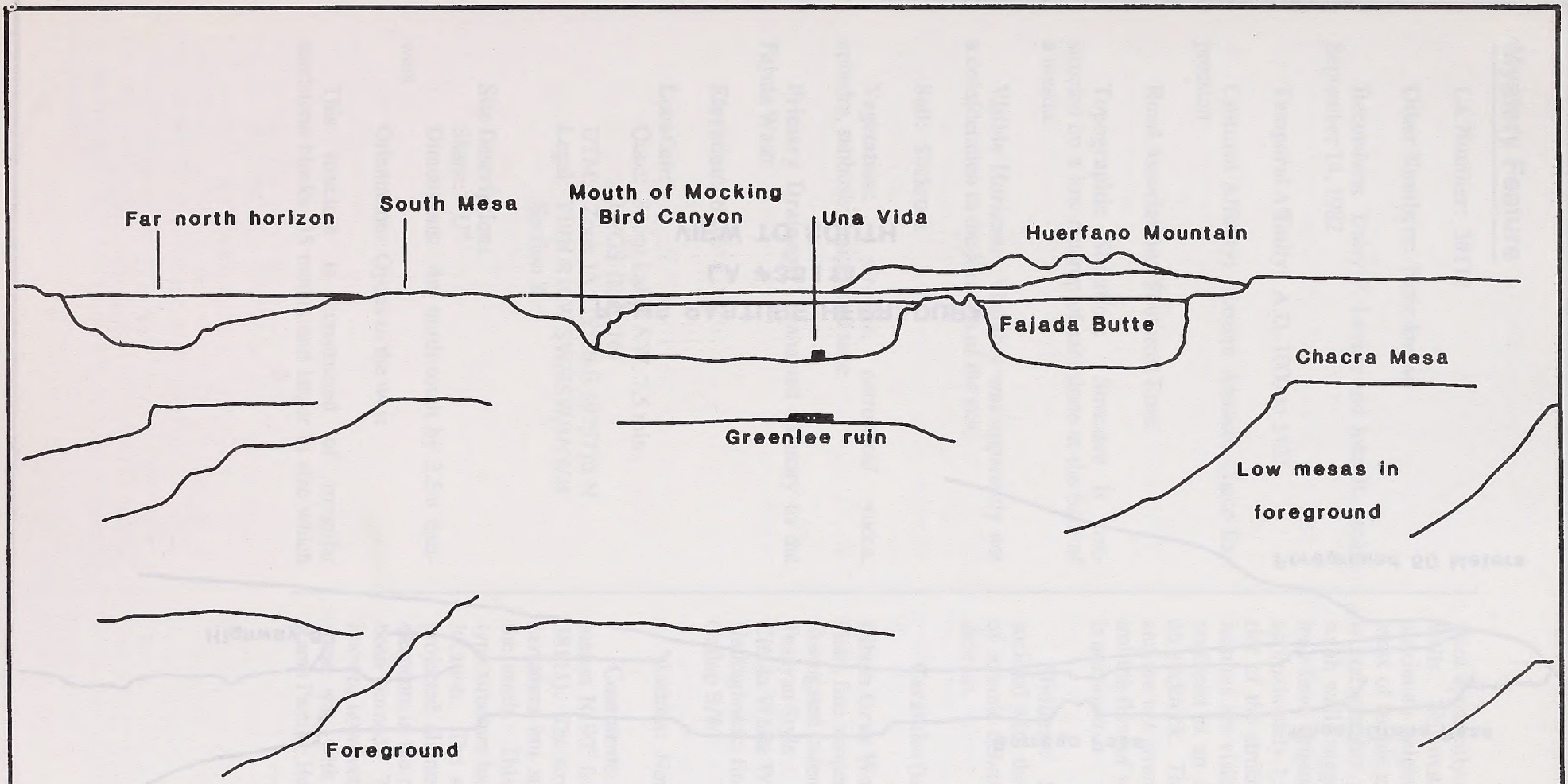




RAMS PASTURE HERRADURA

LA #38111

Recorded by John R. Stein
Daisy F. Levine
July 2, 1982



RAMS PASTURE HERRADURA

LA #38111

VIEW TO NORTH

RAMS PASTURE HERRADURA
LA #38111
VIEW TO SOUTH

Mystery Feature

LA Number: 38112

Other Numbers: None known

Recorders: Daisy F. Levine and John R. Stein; September 14, 1982

Temporal Affinity: A.D. 1000 to 1125

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: Southeast Road

Topographic Situation: Structure is constructed on a low outcrop of sandstone at the base of a mesita.

Visible Horizon: Visibility was apparently not a consideration in the location of the site.

Soil: Slickrock

Vegetation: Grasses, narrowleaf yucca, ephedra, saltbush, juniper and sage

Primary Drainage: Unnamed tributary to the Fajada Wash

Elevation: 6740'

Location:
Quad: Seven Lakes NW, 7.5 min., USGS (Map 16)
UTM: Zone 13 235590 E 3975770 N
Legal: T19N R10W SW/4SW/4NW/4 Section 8

Site Description:
Shape: "U"
Dimensions: 4m north-south by 3.5m east-west
Orientation: Opens to the west

This structure is constructed of irregular sandstone blocks .35 meters and larger in size which were apparently once irregularly stacked to form low walls. This material is now tumbled about with the maximum height of intact wall at .40 meters. The mass of rubble at the rear of the structure (east wall) is considerably greater than that for the north and south walls suggesting that the north and south walls may have originally been terraced up to a rear wall approximately 1.5 to two meters in height. The interior of the structure is devoid of fill and no interior features are visible. Approximately 21 meters to the northeast is an alignment of large sandstone blocks on slickrock. These blocks range to .5 meters in size and are not arranged in a situation which would control the flow of water. The function of this alignment is unknown.

Middens: No formal midden deposition is associated with the structural remains. A slight scatter of ceramic debris occurs in the immediate vicinity of the ruin.

Ceramics (total from site area):

Cibola Gray Ware:	**Jar**	**Bowl**	**Indeterminate**
Plain, fine temper			4
Corrugated Indented, Tusayan Style	5		
Cibola White Ware			
Undiagnostic, fine temper	2		5
Gallup B/W	2		

Lithics: None observed

Comments: This structure is located 650 meters N190° from the Rams Pasture Herradura (LA 38111). The structure is considerably lower than the herradura but still commands an excellent view to the north. This feature is similar to the herradura type structure but differs in may respects, particularly location. The structure is located very near to the projected alignment of the Southeast Road. Some elements in the rubble mass show evidence of having been burned. The function of the structure is unknown, however, it is possible that it functioned in some way with a prehistoric route passing by the Rams Pasture Herradura.

Alignment of large sandstone blocks on slickrock

TRUE NORTH

0 1 2 3 4 5 10

SCALE-METERS

MYSTERY FEATURE

LA #38112

Recorded by John R. Stein &
Daisy F. Levine
Sept. 14, 1982

Coyote Canyon Herradura

LA Number: 38453

Other Numbers: None known

References: None known

Recorders: John Roney and John R. Stein; October 11, 1982

Temporal Affinity: A.D. 925 to 1300. Most sherds date between A.D. 925 and 1125.

Cultural Affinity: Eastern Anasazi, presumably Chaco Expression

Road Association: Peach Springs to Grey Ridge Segment of Coyote Canyon Road

Topographic Situation: Site is located on the crest of a north-south trending ridge which lies between Grey Ridge Wash and Coyote Wash. This is the first major topographic elevation to the southeast of Tohatchi Flats.

Visible Horizon: A spectacular view to the west is afforded from this location.

Soil: Exposed sandstone bedrock in active dunes

Vegetation: Grasses, juniper

Primary Drainage: Grey Ridge Wash

Elevation: 6160'

Location:
Quad: Chuska Lake, 7.5 min., USGS (Map 35)
UTM: Zone 12 714450 E 3962090 N
Legal: T18N R17W SE/4NE/4NE/4 Section 22 (unsurveyed)

Site Description: The Coyote Canyon Herradura consists of two and possibly three structures which flank the Peach Springs to Grey Ridge Roadway. Because this area is essentially an active dune, the prehistoric road is not visible here, although constructed segments are found less than 200 meters to the east and west. Structures are constructed on exposures of sandstone bedrock which elevates them somewhat above the presumed road surface. The projected alignment of the roadway places it between the two structures. Distribution of ceramic material in the site area corresponds closely with the projected alignment.

Structure Description Structure A:
Shape: Cluster
Dimensions: 1: 4m diameter
2: 4m to 5m diameter
Orientation: Unknown

Structure Description Structure B:
Shape: "C"
Dimensions: 5m by 4m
Orientation: East-northeast

Structure C consists of a low mound of sandstone rubble which may represent an additional structural feature. No wall alignments were visible, however, and the formal characteristics of this feature are unknown.

Masonry: The enclosures which compose the Coyote Canyon Herradura are constructed of light colored, friable sandstones which are now heavily weathered. Structure A is the most massive of the constructions and is reduced to a low mound of rubble which is exaggerated by its placement atop a knob of exposed bedrock. In general, wall alignments are poorly visible. However, Circle No. 1 is clearly a circular enclosure four meters in diameter with walls .8 to one meter in thickness. Massive compound to rubble core masonry is suggested by the wall thickness. Structure B is consistent with Structure A in construction although the walls are not as massive in character. Size of the elements utilized in both structures averaged .3 by .3 by .1 meters.

No formal midden disposition was noted in association with the structural remains. A slight scatter of ceramic and lithic debris appears to correspond to the projected alignment of the prehistoric road. The following sample represents approximately 75 percent of the material in the site area.

Ceramics:			Indeterminate
Cibola Gray Ware	**Jar**	**Bowl**	
Plain	11		
Corrugated Indented	13		
Chuska Gray Ware			
Plain	1		
Cibola White Ware			
Undiagnostic	9	1	1
Kiatuthlana B/W		1	
Gallup B/W	4	9	
Escavada B/W	1	1	
Carbon Painted White Ware			
Unidentified		1	
White Mountain Red Ware			
Unidentified		1	
St. John's Polychrome		4	

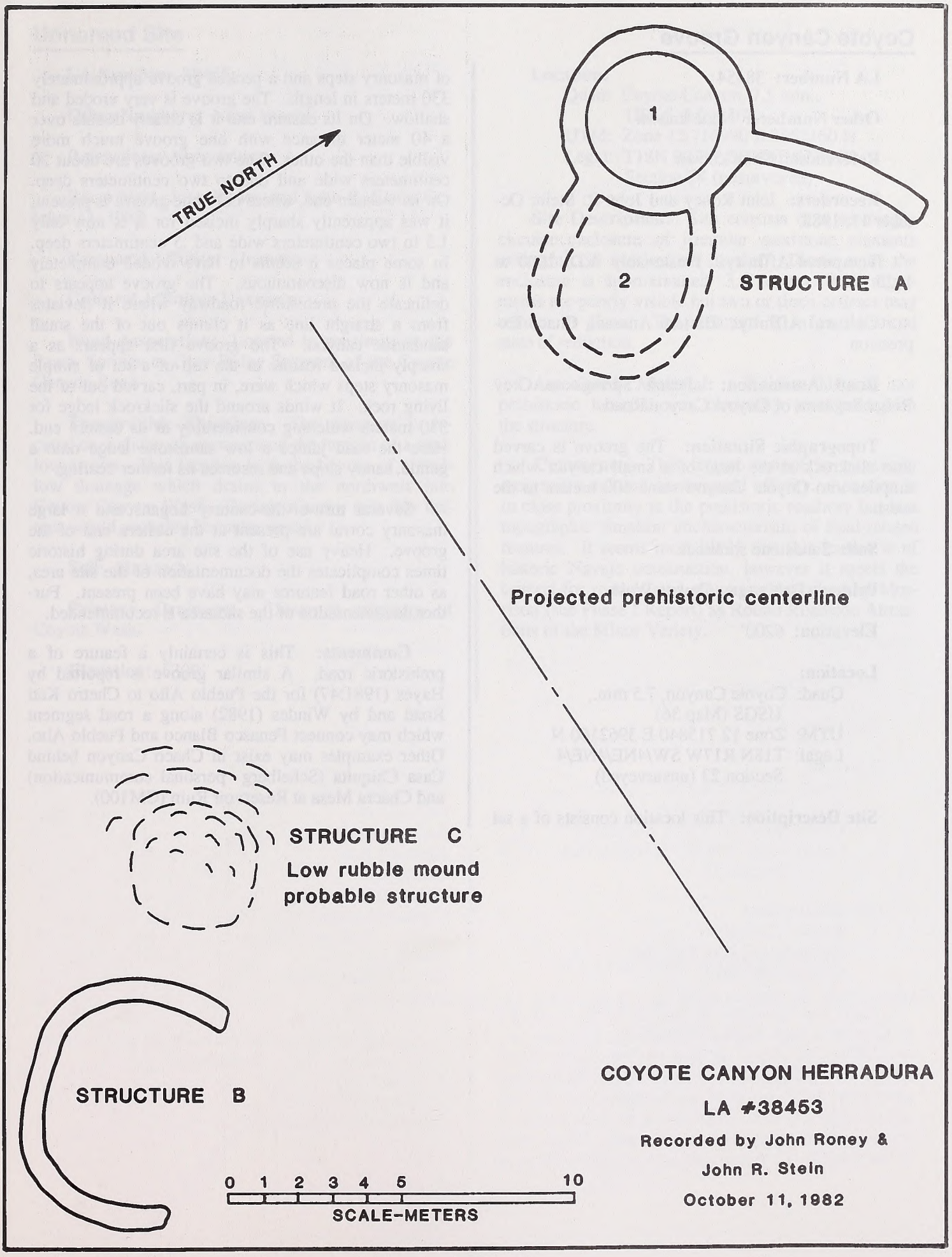
Lithics	Frequency
Petrified wood	7
Miscellaneous chalcedony	4
Jemez obsidian	1
Unidentified obsidian	1
White chert	2
Washington Pass chert	1

Comments: Two concentrations of fire reddened bedrock are apparent to the east of the site. It is not known whether these represent an earlier Archaic component or potential evidence for signalling at this location. Lithic material seemed to be common and sherds less common around these two features.

Fragments of burned bone were also present. These observations could suggest that the features are related to hunting and gathering activities.

There are several similarities between the Coyote Canyon Herraduras and the site of Poco (LA 41010) which is located on the north rim of Chaco Canyon. Structure A consists of a cluster of circular enclosures reminiscent of the central masonry structure at Poco. Further, Poco includes a circular firebox associated with lithic debris, otherwise lithic artifacts are virtually unknown for herradura locations. For a discussion of Poco see Stein and Levine (1983:C7-9.)

This site was located and documented just prior to sundown during the onset of a sleet storm after a long day. Unfortunately there was not time to carefully map and record the site area. Although the juxtaposition of the site features is accurate, the area was not documented as carefully as the other herraduras in this report, thus the map may be subject to minor revisions.


TRUE NORTH
1
2
STRUCTURE A
Projected prehistoric centerline
STRUCTURE C
Low rubble mound
probable structure
STRUCTURE B
0 1 2 3 4 5 10
SCALE-METERS
COYOTE CANYON HERRADURA
LA #38453
Recorded by John Roney &
John R. Stein
October 11, 1982

Coyote Canyon Groove

LA Number: 38454

Other Numbers: None known

References: None known

Recorders: John Roney and John R. Stein; October 11, 1982

Temporal Affinity: Presumably A.D. 1000 to 1125

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: Peach Springs to Grey Ridge Segment of Coyote Canyon Road

Topographic Situation: The groove is carved into slickrock at the head of a small canyon which empties into Coyote Canyon some 600 meters to the west.

Soil: Sandstone slickrock

Primary Drainage: Coyote Wash

Elevation: 6200'

Location:
Quad: Coyote Canyon, 7.5 min., USGS (Map 36)
UTM: Zone 12 715840 E 3962160 N
Legal: T18N R17W SW/4NE/4NE/4 Section 23 (unsurveyed)

Site Description: This location consists of a set of masonry steps and a pecked groove approximately 330 meters in length. The groove is very eroded and shallow. On its eastern end it is clearly double over a 40 meter distance with one groove much more visible than the other. The two grooves are about 20 centimeters wide and one to two centimeters deep. On its western end, where only one groove is present, it was apparently sharply incised for it is now only 1.5 to two centimeters wide and .5 centimeters deep. In some places it seems to have eroded completely and is now discontinuous. The groove appears to delineate the prehistoric roadway where it deviates from a straight line as it climbs out of the small sandstone canyon. The groove first appears as a sharply incised feature at the top of a set of simple masonry steps which were, in part, carved out of the living rock. It winds around the slickrock ledge for 330 meters widening considerably at its eastern end. Here the road jumps a low sandstone ledge onto a gentle, sandy slope and resumes its former bearing.

Several turn-of-the-century hogans and a large masonry corral are present at the eastern end of the groove. Heavy use of the site area during historic times complicates the documentation of the site area, as other road features may have been present. Further documentation of the site area is recommended.

Comments: This is certainly a feature of a prehistoric road. A similar groove is reported by Hayes (1981:47) for the Pueblo Alto to Chetro Ketl Road and by Windes (1982) along a road segment which may connect Penasco Blanco and Pueblo Alto. Other examples may exist in Chaco Canyon behind Casa Chiquita (Schelberg personal communication) and Chacra Mesa at Reservoir Ruin (CM100).

Unnamed Site

LA Number: 38455

Other Numbers: None known

References: None known

Recorders: John Roney and John R. Stein; October 11, 1982

Temporal Affinity: Unknown

Cultural Affinity: Unknown

Road Association: Located in proximity to the Peach Springs to Grey Ridge Segment of the Coyote Canyon Road

Topographic Situation: The structure is located on a slickrock exposure on the margin of a shallow arroyo. This location is in the bottom of a shallow drainage which drains to the northwest into Coyote Canyon Wash. During a heavy rain this feature would probably be under water.

Soil: Slickrock

Primary Drainage: Unnamed tributary of Coyote Wash

Elevation: 6300'

Location:

Quad: Coyote Canyon, 7.5 min., USGS (Map 36)
UTM: Zone 12 716990 E 3962160 N
Legal: T18N R17W SE/4NE/4NW/4 Section 24 (unsurveyed)

Site Description: Site consists of a seemingly circular enclosure of irregular sandstone elements averaging 30 centimeters in size. Diameter of the enclosure is approximately 3.5 meters. Wall alignments are poorly visible but two or three courses may remain in place. The structure is in an advanced state of reduction.

Associated Material: Neither historic nor prehistoric material was obviously associated with the structure.

Comments: This feature cannot be positively assigned a cultural or temporal affinity. Location is in close proximity to the prehistoric roadway but in a topographic situation uncharacteristic of road-related features. It seems most likely that this feature is of historic Navajo construction, however it meets the criteria for road-related structures described by Morrison (see Phase I Report) as Round Roadside Attractions of the Minor Variety.

Little Ear Herradura

LA Number: 38457

Other Numbers: None known

References: None known

Recorders: John Roney, John Stein; October 11, 1982

Temporal Affinity: A.D. 800 to 1250. Most sherds date to between A.D. 870 and 1125.

Cultural Affinity: Eastern Anasazi, presumably Chaco Expression

Road Association: Peach Springs to Grey Ridge Segment of Coyote Canyon Road

Topographic Situation: Site is situated on the crest of a north-south trending ridge which lies between Coyote Canyon and Big Spring Canyon.

Visible Horizon: The situation is elevated with a commanding view to the west, north, and east.

Soil: Sandy loam

Vegetation: Grasses, snakeweed, saltbush, piñon, juniper

Primary Drainage: Coyote Wash

Elevation: 6417'

Location:
Quad: Coyote Canyon, 7.5 min., USGS (Map 37)
UTM: Zone 12 719350 E 3962450 N
Legal: T18N R16W NE/4NE/4NE/4 Section 19

Site Description:
Shape: C of arc
Dimensions: 3.5m by 5.5m
Orientation: East

Little Ear Herradura is located on the crest of a ridge with a high degree of visibility both east and west along the Peach Springs to Grey Ridge Roadway. The road appears to make a slight angle change here from N67° to N79° as it approaches the herradura from the east. The swale is quite visible in the immediate vicinity of the site area. Swale width is consistently 10 meters and approximately 30 to 50 centimeters deep. As the roadway passes the herradura, however, the swale apparently narrows to six meters in width and is only slightly ground-visible. The structure appears to have been a low wall constructed in an arc open to the east and articulated with the roadway. Scattered rubble suggests that the masonry rubble indicates that walls probably never exceeded one meter in height. Wall alignments can be discerned in a low rubble mound of approximately 0.2 meters relief. Width and construction technique of the wall are not known. Masonry elements are light colored friable sandstones which are now quite weathered. Element size averages .3 by .3 by .1 meters.

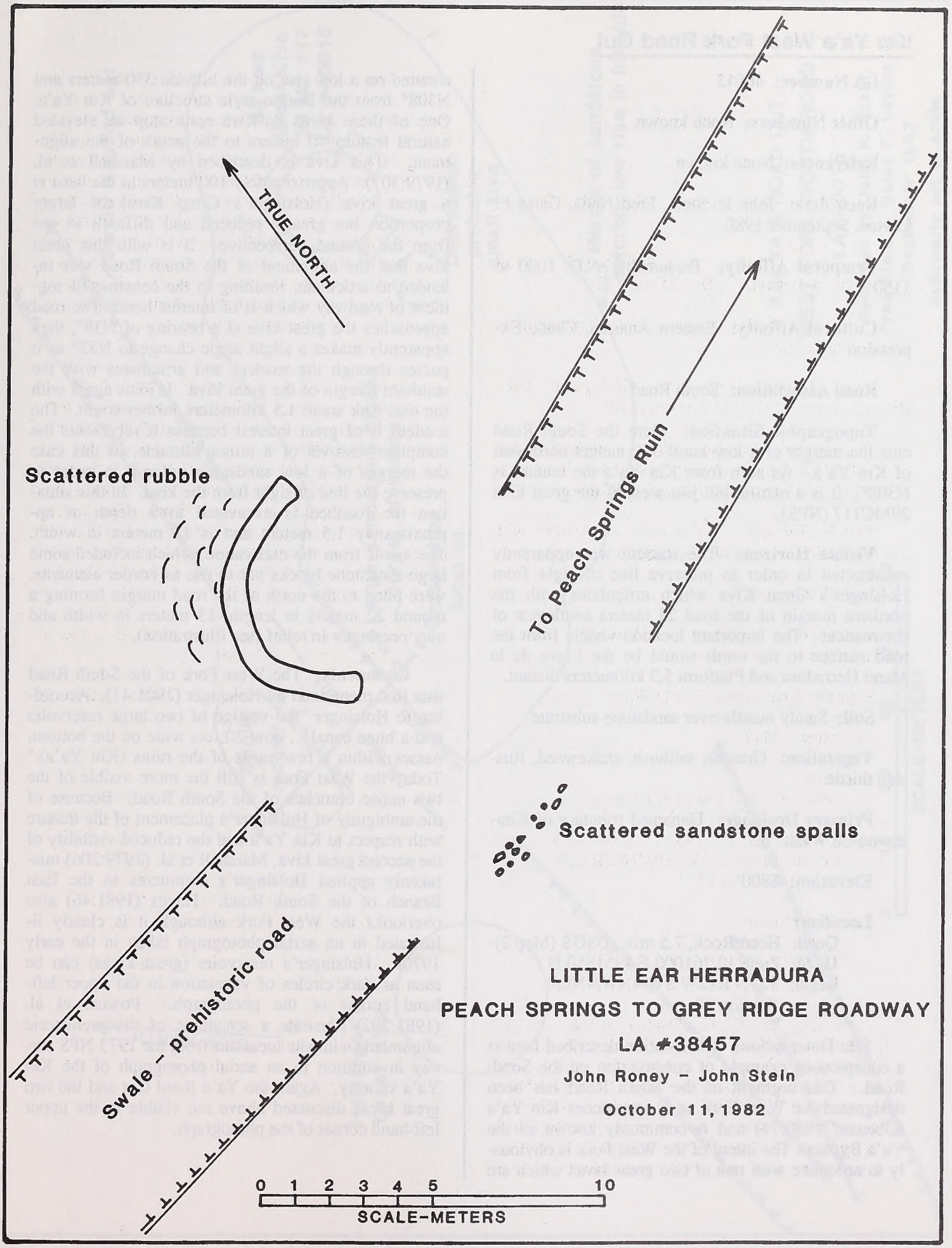
Middens: As with other structures of the herradura type no formal midden is associated with the structural remains. A low density surficial scatter of ceramic debris and a trace of lithic material are concentrated in the prehistoric right-of-way principally west of the structure where the road crosses a short expanse of exposed sandstone bedrock. The material scatter extends approximately 90 meters to the west of the structure. Characteristically, the sherd density is considerably greater in this area than the sherd association for the road in general.

Ceramics (90 percent of the material in the site vicinity, eg. all we could find):

Cibola Gray Ware:	Jar	Bowl	Indeterminate
Plain	16		
Wide Banded	2		
Smoothed	1		
Corrugated Indented	9		
Cibola White Ware			
Undiagnostic	9		1 ladle frag.
Red Mesa B/W	1	4	
Escavada B/W	1	5	
Gallup B/W	3	3	
Chaco B/W	3	1	
Carbon Painted White Ware			
Undiag., McElmo Style	1	1	1
Chuska McElmo		1	
Chuska White Wares			
Undiagnostic			2

Lithics (90 percent of the material, as with ceramics):

	Frequency
Petrified wood	1
Washington Pass chert	1
Pedernal-like chalcedony	2



LITTLE EAR HERRADURA

PEACH SPRINGS TO GREY RIDGE ROADWAY

LA #38457

John Roney - John Stein

October 11, 1982

Kin Ya'a West Fork Road Cut

LA Number: 40015

Other Numbers: None known

References: None known

Recorders: John R. Stein, Fred Nials, Daisy F. Levine; September 1980

Temporal Affinity: Presumably A.D. 1000 to 1150

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: South Road

Topographic Situation: Here the South Road cuts the margin of a low knoll 350 meters northwest of Kin Ya'a. As seen from Kin Ya'a the feature is N308°. It is a natural hill just west of the great kiva 29MC117 (NPS).

Visible Horizon: The roadcut was apparently constructed in order to preserve line of sight from Holsinger's Great Kiva which articulates with the northern margin of the road 25 meters southwest of the roadcut. The important location visible from the road surface to the north would be the Llave de la Mano Herradura and Platform 5.3 kilometers distant.

Soil: Sandy mantle over sandstone substrate

Vegetation: Grasses, saltbush, snakeweed, Russian thistle

Primary Drainage: Unnamed tributary of Kim-me-no-oli Wash

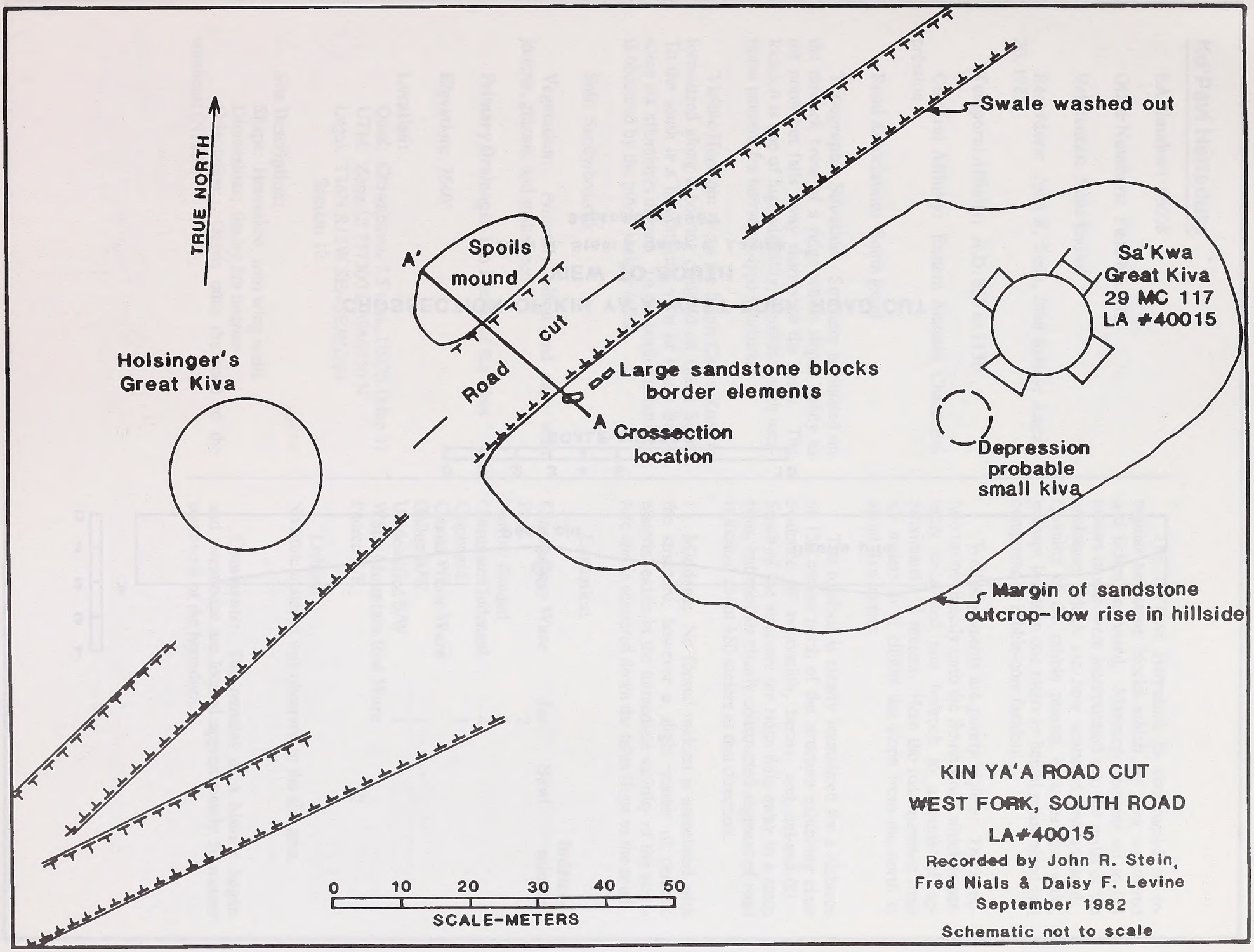
Elevation: 6800'

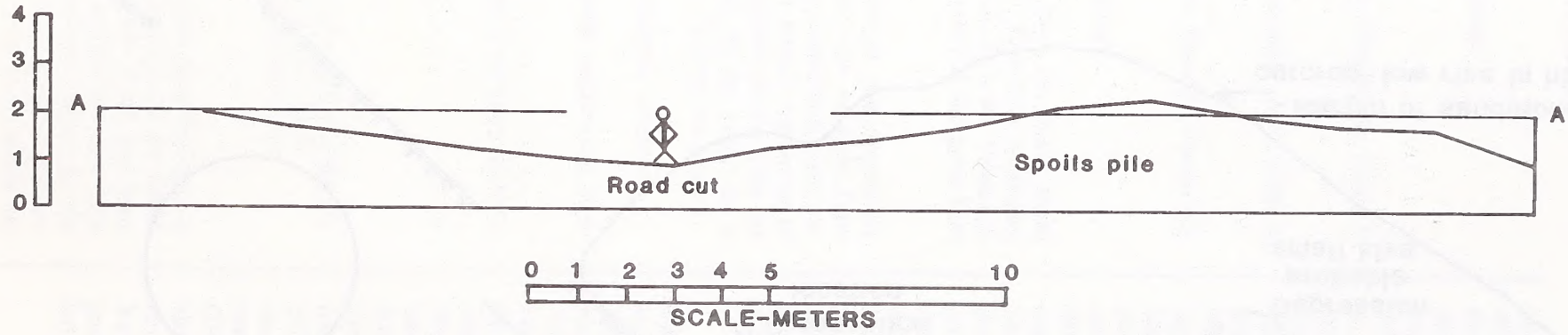
Location:

Quad: Heart Rock, 7.5 min., USGS (Map 2)
UTM: Zone 12 761000 E 3951850 N
Legal: T17N R12W SW/4NW/4NE/4 Section 28

Site Description: The location described here is a conspicuous example of construction on the South Road. This segment of the South Road has been designated the West Fork as it approaches Kin Ya'a (Obenauf 1980:71) and is commonly known as the Ya'a Bypass. The intent of the West Fork is obviously to articulate with one of two great kivas which are situated on a low rise on the hillside 350 meters and N308° from the Bonito style structure of Kin Ya'a. One of these kivas Sa'Kwa rests atop an elevated natural feature 40 meters to the south of the alignment. This kiva is described by Marshall et al. (1979:307). Approximately 100 meters to the west is a great kiva (Holsinger's Great Kiva) of larger proportion but greatly reduced and difficult to see from the ground perspective. It is with this great kiva that the alignment of the South Road was intended to articulate, resulting in the constructed segment of roadway which is of interest here. The road approaches the great kiva at a bearing of N38°, then apparently makes a slight angle change to N32° as it passes through the roadcut and articulates with the southern margin of the great kiva. It joins again with the east fork some 1.5 kilometers further south. The roadcut is of great interest because it represents the complete removal of a minor obstacle, in this case the margin of a low sandstone outcrop in order to preserve the line of sight from the kiva. In this situation the roadbed is excavated to a depth of approximately 1.5 meters and is 15 meters in width. The spoils from the excavation, which included some large sandstone blocks put to use as border elements, were piled to the north of the road margin forming a mound 22 meters in length, 13 meters in width and over one meter in relief (see illustration).

Comments: The West Fork of the South Road was first mentioned by Holsinger (1901:41). According to Holsinger "the vestige of two large reservoirs and a huge canal ... now 20 feet wide on the bottom, passes within a few yards of the ruins (Kin Ya'a)." Today the West Fork is still the more visible of the two major branches of the South Road. Because of the ambiguity of Holsinger's placement of the feature with respect to Kin Ya'a and the reduced visibility of the second great kiva, Marshall et al. (1979:206) mistakenly applied Holsinger's comments to the East Branch of the South Road. Hayes (1981:46) also overlooks the West Fork although it is clearly illustrated in an aerial photograph taken in the early 1970s. Holsinger's reservoirs (great kivas) can be seen as dark circles of vegetation in the upper left-hand corner of the photograph. Powers et al. (1983:202) illustrate a schematic of the prehistoric alignments with site locations from the 1973 NPS survey in addition to an aerial photograph of the Kin Ya'a vicinity. Again the Ya'a Road Cut and the two great kivas discussed above are visible in the upper left-hand corner of the photograph.


TRUE NORTH
A'
Spoils mound
cut
Road
A
Crossection location
Holsinger's Great Kiva
Large sandstone blocks border elements
Swale washed out
Sa'Kwa Great Kiva 29 MC 117 LA #40015
Depression probable small kiva
Margin of sandstone outcrop- low rise in hillside
0 10 20 30 40 50
SCALE-METERS
KIN YA'A ROAD CUT
WEST FORK, SOUTH ROAD
LA#40015
Recorded by John R. Stein, Fred Nials & Daisy F. Levine
September 1982
Schematic not to scale



CROSSECTION OF KIN YA'A WEST FORK ROAD CUT
VIEW TO SOUTH

John R. Stein & Daisy F. Levine

September 1982

Ko'Pavi Herradura

LA Number: 46008

Other Numbers: Field No. 772

References: None known

Recorders: John R. Stein, John Roney; August 20, 1983

Temporal Affinity: A.D. 850 to 1130

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: South Road

Topographic Situation: Structure is situated on the rimrock brow of a ridge which slopes gently to the north but falls away sharply to the south. The location is one of high visibility, consistent with locational patterns for herradura-type structures.

Visible Horizon: Here the South Chaco Road is formalized along a bearing centered on Hosta Butte. To the south is a breathtaking view of Hosta Butte, some six kilometers distant. To the north the horizon is obscured by the piñon-juniper forest.

Soil: Sandy/bedrock

Vegetation: Primarily piñon and sage with juniper, grasses, and snakeweed

Primary Drainage: Rio Puerco of the West

Elevation: 7640'

Location:
Quad: Crownpoint, 7.5 min., USGS (Map 1)
UTM: Zone 12 757300 E 3946770 N
Legal: T16N R13W SE/4SE/4NE/4
Section 12

Site Description:
Shape: Horseshoe, with wing walls
Dimensions: 6m by 5m interior
Orientation: Opens onto the road to the southeast (N120°)

The Ko'Pavi Herradura is constructed of irregular sandstone blocks which are now weathered and lichen encrusted. Masonry elements up to 0.4 meters in size were incorporated into the walls of the enclosure, which are now scattered and reduced. Quantity of the rubble present indicates low walls, perhaps less than one meter in height constructed in a compound or rubble-core fashion.

Wall alignments are poorly visible. The structure opens directly onto the South Road which is partially excavated into bedrock to a depth of approximately .5 meters. Here the road narrows from six meters as it climbs the slope from the north to about five meters.

The roadbed is clearly formalized for a distance of 150 meters north of the structure exhibiting clear evidence of excavation, berms, and cut-and-fill. South of the structure the ridge falls away in a steep talus, but another clearly constructed segment of road is located about 150 meters in that direction.

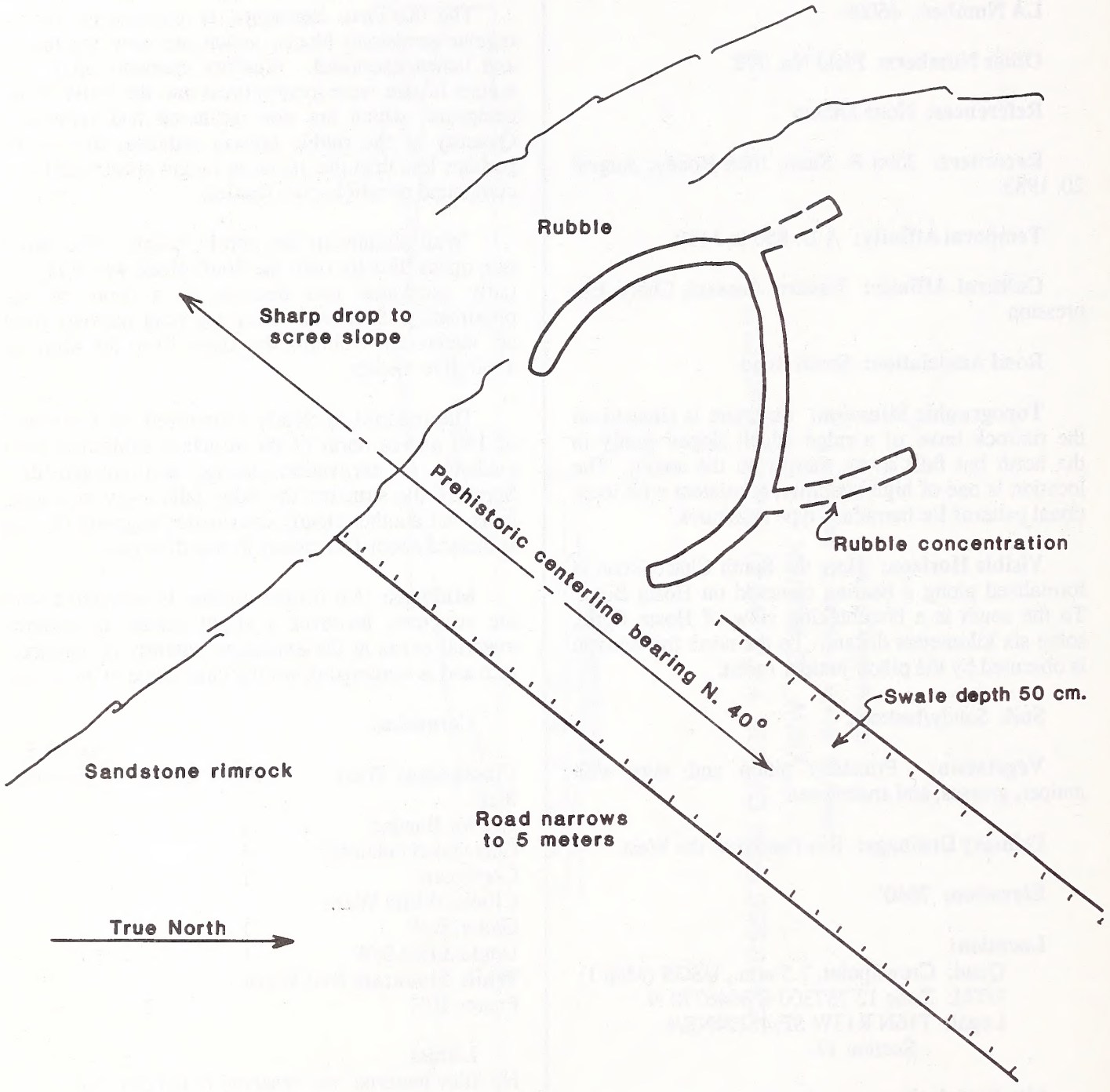
Middens: No formal midden is associated with the structure, however a slight scatter of ceramic material exists in the immediate vicinity of the structure and is scattered down the talus slope to the south.

Ceramics:

Cibola Gray Ware	**Jar**	**Bowl**	**Indeterminate**
Plain	2		1
Narrow Banded	4		
Corrugated Indented	4		
Clapboard	1		
Cibola White Ware			
Gallup B/W	1		
Unidentified B/W	1		
White Mountain Red Ware			
Puerco B/R		2	

Lithics:
No lithic material was observed in the site area.

Comments: The remains of a historic hogan and sweatlodge are located approximately 50 meters southwest of the herradura.



KO' PAVI HERRADURA
LA 46008
Recorded by John Roney & John Stein
Aug. 20, 1983

Crownpoint Herradura

LA Number: 46009

Other Numbers: Field No. 773

References: None known

Recorders: John Roney, John R. Stein; August 20, 1983

Temporal Affinity: A.D. 850 to 1125

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: South Road

Topographic Situation: Site is situated on a mesa top 30 to 40 meters south of the slickrock of the mesa rim. The prehistoric alignment is clearly defined across the slickrock by a dense scatter of sherds and is excavated/formalized as it jumps onto the mesa top.

Visible Horizon: The horizon is obscured by dense piñon and juniper cover. Location is consistent with other structures of the herradura class in that it is on the highest part of the mesa top.

Soil: Sandy

Vegetation: Piñon, juniper, sage

Primary Drainage: Kim-me-ni-oli Wash

Elevation: 7720'

Location:
Quad: Crownpoint 7.5 min., USGS (Map 1)
UTM: Zone 12 758480 E 3948340 N
Legal: T16N R12 W. SE/4SW/4NE/4 Section 6

Site Description:
Shape: Oval with wingwall
Dimensions: Interior dimensions measure 10.5 by 7.0 m
Orientation: Opens onto the South Road to the southeast (N120°)

The Crownpoint Herradura is so named from proximity to the formation referred to as Crownpoint which in fact does resemble a king's crown. Origin of the name for the formation is unknown, however legend tells that windows in the sandstone of the formation whisper and cry and that the wind originates here. The herradura structure lies on the crest of the mesa top obscured by sand and dense pinyon and juniper cover. Blocks and slabs of native buff sandstone outline the enclosure and suggest the presence of a relatively massive masonry wall, either rubble core or compound in construction, and perhaps a meter or so in original height. A concentration of masonry elements along the western wall of the enclosure indicates that the wall may have been slightly higher in this area. A second contiguous enclosure or possibly a wing wall appears to have articulated with this western wall as suggested by alignments of slabs and scattered masonry elements. Unfortunately the surface here is obscured by a large fallen piñon. Fire reddening was noted on several masonry elements.

Middens: No formal midden is associated with the structure. However, a sparse scatter of ceramic and lithic material was documented in the vicinity of the structure.

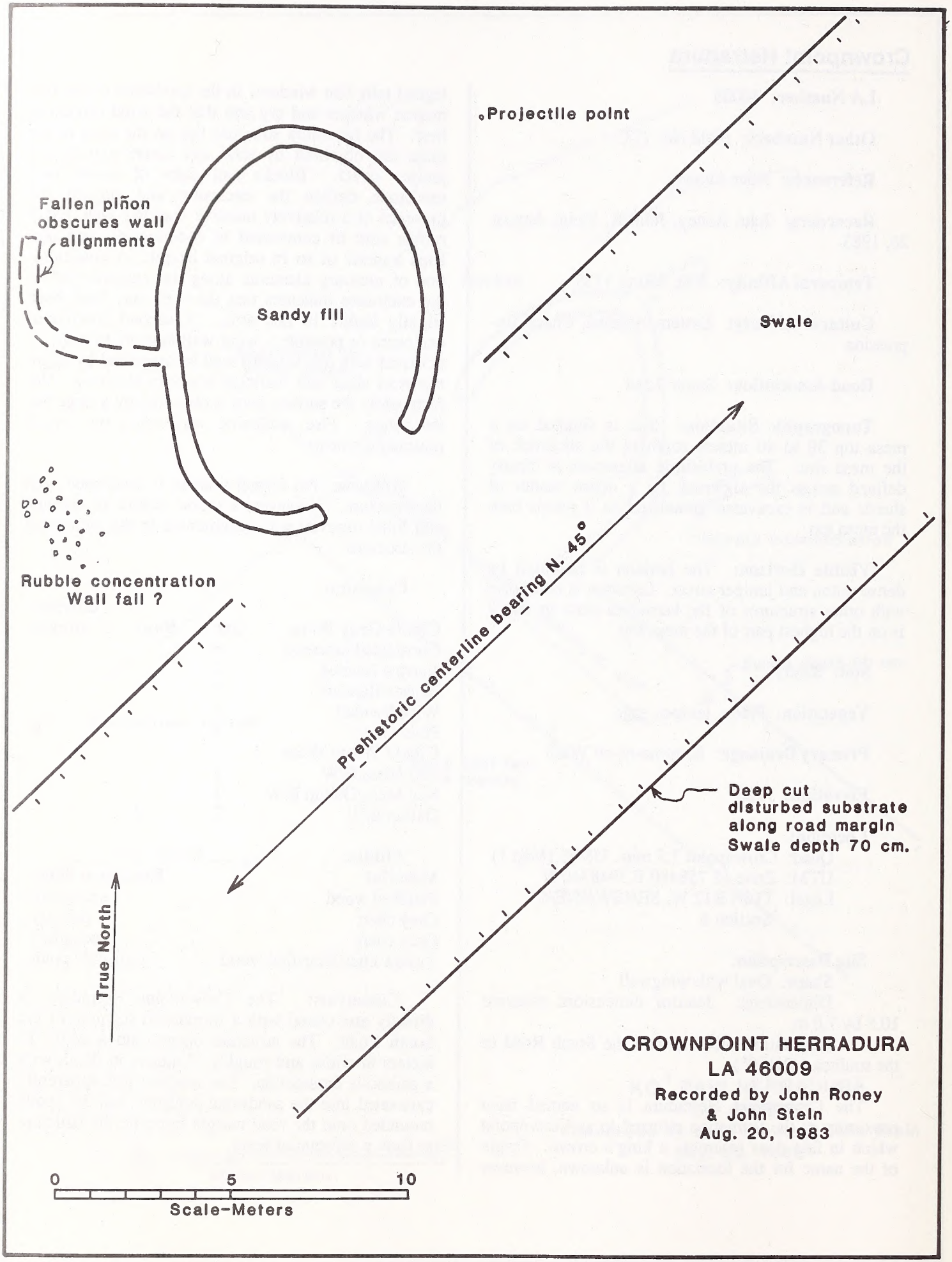
Ceramics:

Cibola Gray Ware	Jar	Bowl	Indeterminate
Corrugated Indented	6		
Narrow Banded	1		
Incised Banded	1		
Wide Banded	1		
Plain Gray	1		4
Cibola White Ware			
Red Mesa B/W	1		
Red Mesa/Gallup B/W	1		
Gallup B/W	3	2	

Lithics:

Material	Reduction Stage
Petrified wood	secondary
Grey chert	primary
Grey chert	secondary
Yellow chert/Petrified wood	projectile point

Comments: The Crownpoint Herradura is directly atriculated with a formalized segment of the South Road. The structure opens onto a swale 12 meters in width and roughly .7 meters in depth with a parabolic crossection. The roadbed was apparently excavated into the sandstone substrate and the spoils mounded onto the road margin opposite the structure to form a substantial berm.



CROWNPOINT HERRADURA
LA 46009
Recorded by John Roney
& John Stein
Aug. 20, 1983

Grey Ridge Compound

LA Number: 47856

Recorders: John Roney, Dave LeGare, John Stein, and Fred York; November 11, 1982 and May 14, 1983

References: None known

Temporal Affinity: A.D. 1000 to 1300

Cultural Affinity: Eastern Anasazi, possibly Chaco Expression

Road Association: Peach Springs to Grey Ridge Segment of Coyote Canyon Road

Topographic Situation: Site is located on floodplain of Grey Ridge Wash in an area of hummocky, semi-stabilized sand dunes. The dunes cover part of this structure.

Visible Horizon: Because of its valley bottom location, visibility is quite restricted, particularly to the west.

Vegetation: Greasewood, grasses

Primary Drainage: Grey Ridge Wash

Location:
Quad: Chuska Lake, 7.5 min., USGS (Map 35)
UTM: Zone 12 712080 E 3961600 N
Legal: T18N R17W SE/4NW/4 Section 21 (unsurveyed)

Site Description: This site consists of a masonry compound forming a rough square 60 meters on a side. Walls of the compound are of rubble core masonry up to .6 meters thick and standing almost two meters high where they are supported by sand dunes. Entry is by a three-meter-wide gate in the east wall, a position which coincides with the projected alignment of the prehistoric road. A second entryway may have been located midway along the southern wall. The southeastern corner of the compound is missing, perhaps indicating that the structure was never completed or that it has been stone-robbed. Although some concentrations of masonry are found inside the compound, few rooms could be defined. A large circular depression 14 meters in diameter is located within the feature. In its overall architectural characteristics Grey Ridge Compound resembles contemporary fortified sites in the Zuni Province (c.f. Kintigh 1982; LeBlanc 1978), or the compound enclosing a great kiva at Yucca House National Monument in southwestern Colorado.

A mound or trash midden with .35 meters of relief is located immediately east of the compound and a diffuse sherd and lithic scatter surrounds the site. Several large trough metates were observed in rubble associated with the compound walls.

Ceramics (two meter by two meter sample):

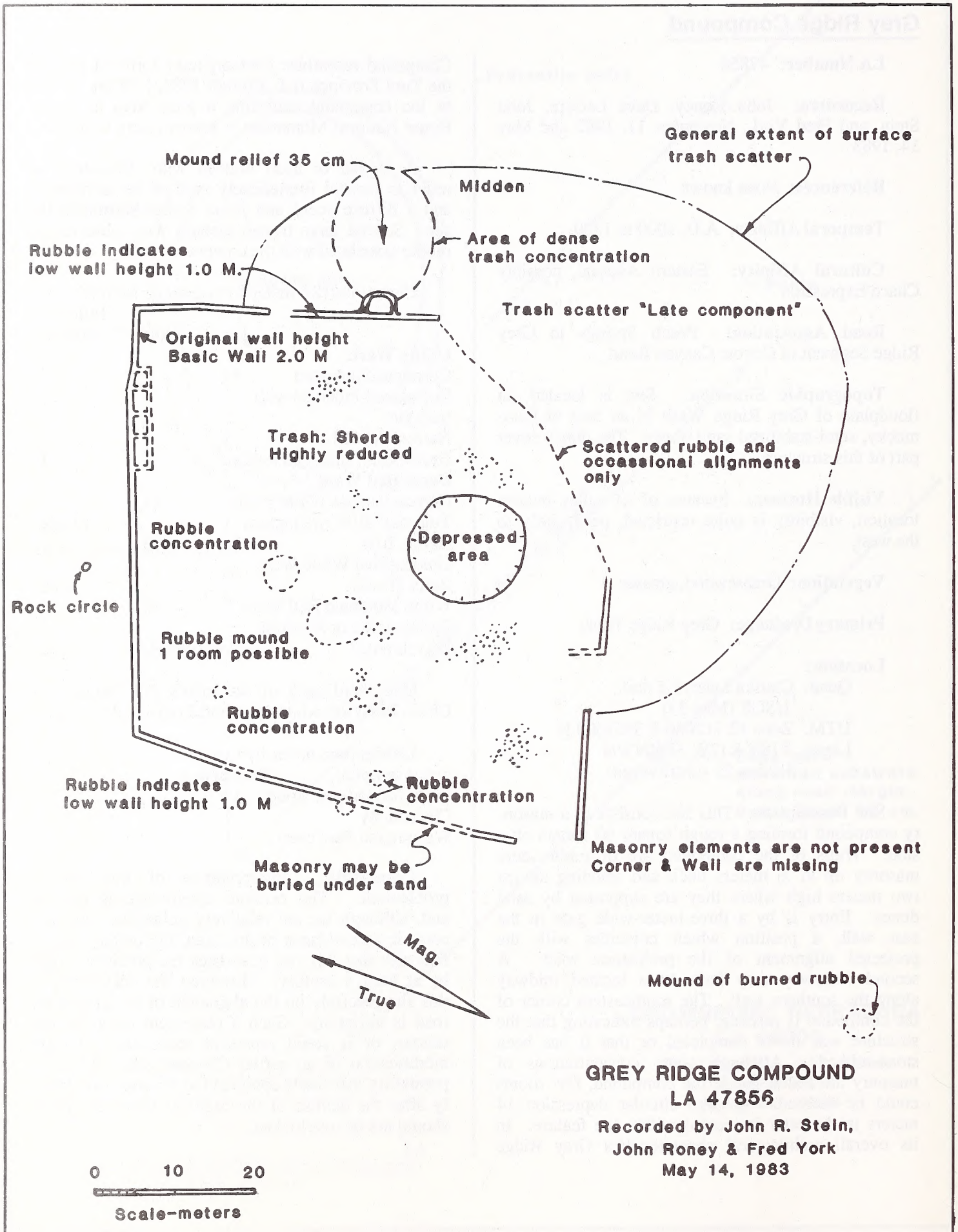
	Jar	Bowl	Indeterminate
Utility Ware			
Corrugated Indented	45		
Corrugated Indented with trachyte	9		
Narrow banded	4		
Brownware, smudged interior			1
Decorated Ware			
Carbon Painted White Ware	6	13	
Tularosa? B/W w/subglaze	1		1 ladle
Gallup B/W	12	3	
Unidentified White Ware Body Sherds			88
White Mountain Red Ware	9	40	
Springerville or Kwakina Polychrome?	7 (one vessel)		

One sherd each of St. John's Polychrome and Chaco Black-on-white were noted outside the sample.

Lithics (two meter by two meter sample):

	Frequency
Dark, banded pet. wood	14
Chalcedony	1
Washington Pass chert	1

Comments: Interpretation of this site is problematic. The ceramic assemblage is unusual and, although we are relatively unfamiliar with late ceramic assemblages in this area, the pottery clearly indicates that this site post-dates the prehistoric road by at least a century. However, the occurrence of this site precisely on the alignment of the prehistoric road is intriguing. Such a placement could be fortuitous, or it could represent reuse and extensive modification of an earlier Chacoan site. Also, the possibility that roads continued to be important locally after the demise of the regional Chacoan system should not be overlooked.


General extent of surface trash scatter
Mound relief 35 cm
Midden
Area of dense trash concentration
Rubble indicates low wall height 1.0 M.
Trash scatter "Late component"
Original wall height Basic Wall 2.0 M
Trash: Sherds Highly reduced
Scattered rubble and occassional alignments only
Rubble concentration
Depressed area
Rock circle
Rubble mound 1 room possible
Rubble concentration
Rubble indicates low wall height 1.0 M
Rubble concentration
Masonry may be buried under sand
Masonry elements are not present Corner & Wall are missing
Mag.
True
Mound of burned rubble
GREY RIDGE COMPOUND
LA 47856
Recorded by John R. Stein, John Roney & Fred York
May 14, 1983
0 10 20
Scale-meters

Standing Rock Herradura

LA Number: 47857

Other Numbers: None known

Recorders: John Roney, Dave LeGare; November 14, 1982

Temporal Affinity: A.D. 850 to 1125

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: Located along the Coyote Canyon Road, east of Standing Rock Ruin. The imaged alignment of this road passes 200 meters to the north of this feature. However, no swale, construction, or other evidence of a prehistoric road was observed either in the vicinity of the feature or at the location of the imaged alignment.

Topographic Situation: Located on top of a 100 to 150 meter wide mesa which stands about 10 meters above the surrounding terrain and 40 meters above the bottomlands of Standing Rock Wash.

Visible Horizon: The skyline to the south is formed by the crest of Dutton Plateau/Lobo Mesa, and to the west of the Chuska Mountains are visible. The view to the north is limited by a higher portion of the mesa, but Shiprock and promentories in the vicinity of White Rock can be seen. Standing Rock Ruin is visible two miles away in a direction of N245°.

Soil: Shallow sandy mantle over sandstone substrate.

Primary Drainage: Standing Rock Wash

Elevation: 6360'

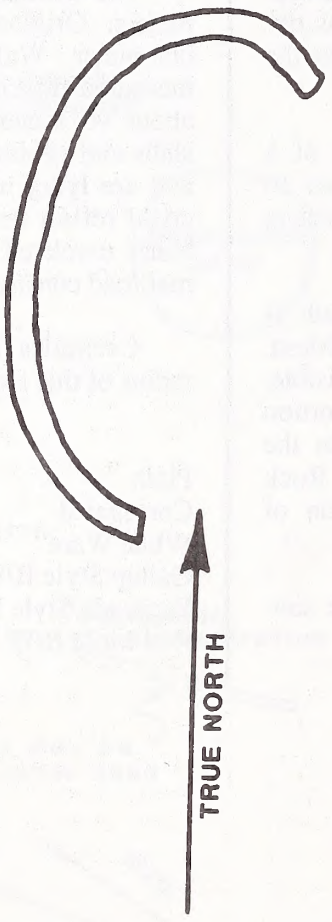
Location:
Quad: Standing Rock, 7.5 min., USGS (Map 39)
UTM: Zone 12 738160 E 3969450 N
Legal: T19N R14W Section 30 (unsurveyed)

Site Description:
Shape: C or arc
Dimensions: 10 by 4 m
Orientation: East

The structure is reduced to a height of about .6 meters. Original height was probably not much over one meter. Walls are of core-veneer masonry, with a measured thickness of .74 meters. For a distance of about 90 meters to the northwest of this structure slabs and pebbles on the surface have been disturbed and are lying with caliche encrusted sides up. This could reflect quarrying activity or could be a disturbance unrelated to the herradura. No evidence of formal road construction was observed.

Ceramics (scatter of 17 sherds within a 25 meter radius of this feature):

	Jar	Bowl	Indeterminate
Plain	2		
Corrugated	4		
White Ware			3
Gallup Style B/W	3		
Escavada Style B/W	3	1	
Red Mesa B/W		1	



STANDING ROCK HERRADURA

LA 47857

Recorded by John Roney &

John Stein

August 21 1983

Deer Springs

LA Number: 47858

Recorders: John R. Stein, Cory D. Breternitz; November 6, 1982

References: None known

Temporal Affinity: Ca. A.D. 1000 to 1125

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: Peach Springs to Grey Ridge Segment of Coyote Canyon Road

Topographic Situation: Structure is situated at the base of a low ridge at the margin of extensive flat alluviated bottomland.

Visible Horizon: Not documented

Soil: Sandy loam

Vegetation: Tumbleweed, snakeweed, grasses

Primary Drainage: Deer Springs Wash

Elevation: 6340'

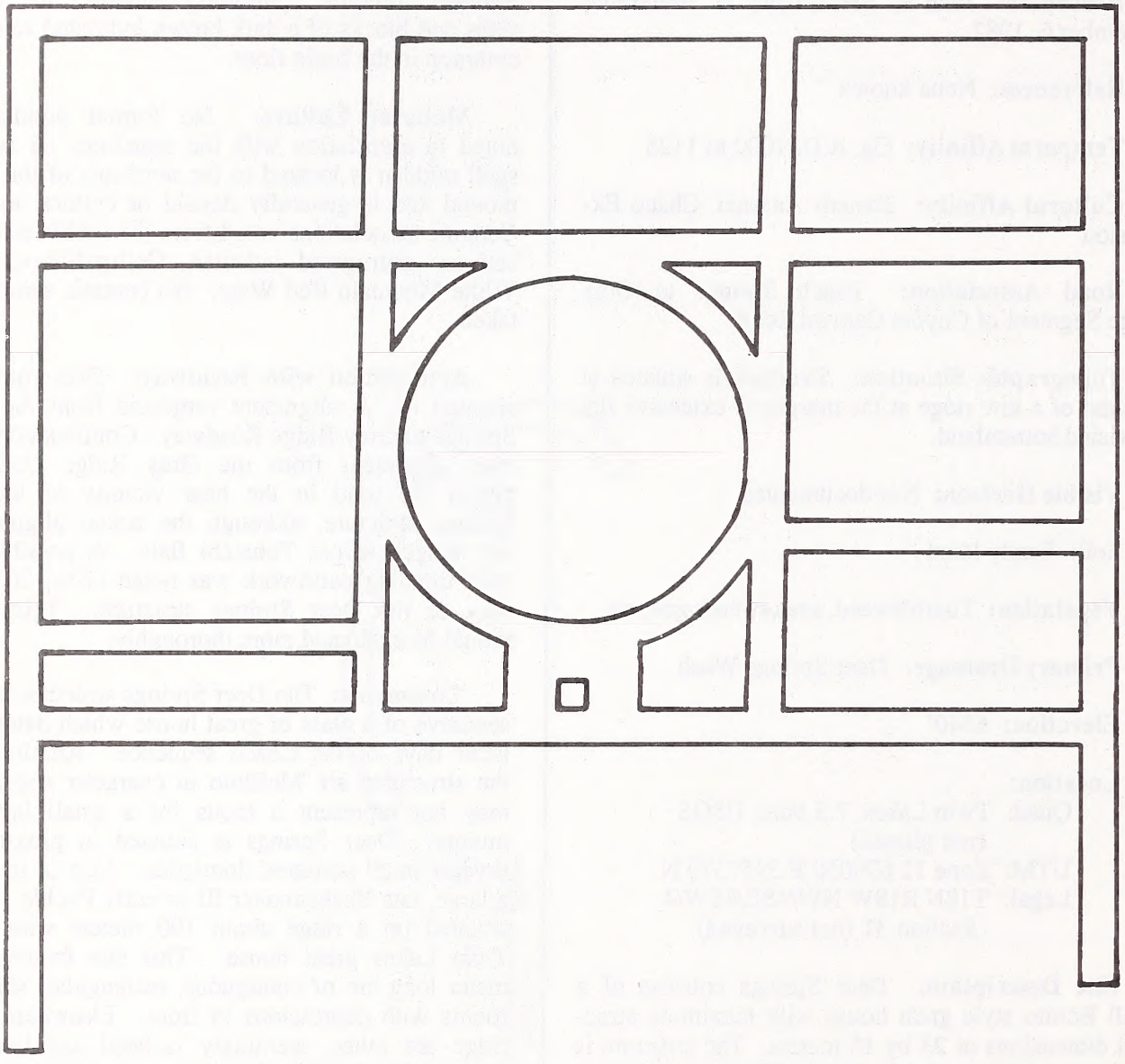
Location:
Quad: Twin Lakes, 7.5 min., USGS (not plotted)
UTM: Zone 12 699050 E 3957370 N
Legal: T18N R18W NW/4SE/4SW/4 Section 31 (not surveyed)

Site Description: Deer Springs consists of a small Bonito style great house with maximum structural dimensions of 23 by 15 meters. The structure is rectangular in form and is composed of a single large surface housed kiva flanked by single story rooms of massive construction with high ceilings. Present relief of the rubble mound is 2.5 to three meters which suggests wall construction of rubble-core masonry. Wall alignments are partially visible even though the structure is collapsed into a mound with rounded contours. Masonry elements are tabular slabs and blocks of a dark brown indurated sandstone common in the basin floor.

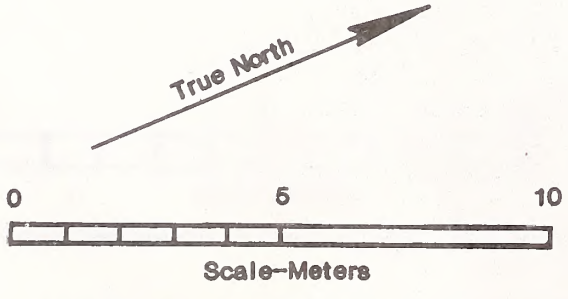
Material Culture: No formal midden was noted in association with the structure. A possible spall midden is located to the northeast of the rubble mound and is generally devoid of cultural material. Ceramic associations noted from the rubble mound itself are corrugated indented, Gallup-Escavada and White Mountain Red Ware. No ceramic sample was taken.

Articulation with Roadway: Deer Springs is situated on an alignment projected from the Peach Springs to Grey Ridge Roadway. Continuation of the road alignment from the Grey Ridge Compound places the road in the near vicinity of the Deer Springs structure, although the actual alignment is not imaged across Tohatchi flats. A possible east-west trending earthwork was noted about 20 meters west of the Deer Springs structure. This feature should be evaluated more thoroughly.

Comments: The Deer Springs structure is representative of a class of great house which dates to the latter days of the Chaco sequence. Architecturally the structures are McElmo in character and may or may not represent a focus for a small late community. Deer Springs is situated in proximity to several small scattered domiciles. Also of interest is a large, late Basketmaker III or early Pueblo I village situated on a ridge about 100 meters west of the Twin Lakes great house. This site features a 20 meter long arc of contiguous, rectangular, slab lined rooms with depressions in front. Elsewhere on the ridge are other, seemingly isolated slab-lined features. In front of the large unit is a dense midden in which plain wares are overwhelmingly predominant. Only three or four sherds of black-on-white pottery were found.



Scattered masonry
Probable
structural
remains



DEER SPRINGS RUIN
LA 47858

Recorded by John R. Stein &
Cory D. Bretemitz
November 7, 1982

Nous Petons du Fue

LA Number: 47859

Reference: None known

Recorders: John R. Stein, Steve Lekson; December 11, 1983

Temporal Affinity: A.D. 850 to 1175

Cultural Affinity: Eastern Anasazi, Chaco Expression

Road Association: Association with the Southeast Roadway is hypothesized.

Topographic Situation: The structure is situated at the base of a low ridge, in a shallow embayment.

Visible Horizon: Visibility is precluded to the north by the nearby ridge. Greenlee Ruin is clearly visible on the horizon to the south.

Soil: Sandy loam

Vegetation: Grasses, saltbush, snakeweed

Primary Drainage: Fajada Wash

Elevation: 6260'

Location:
Quad: Seven Lakes N.W., 7.5' USGS (Map 18)
UTM: Zone 13 237040 E 3095550 N
Legal: T20N R10W SW/4SE/4NE/4 Section 8.

Site Description: Nous Petons du Fue is a small great house of five or six single-story rooms and a housed surface kiva. The structure is U-shaped and measures 19 by 25 meters in maximum dimension. Mound relief is substantial and approaches two meters, suggesting a massively constructed building. A low parapet wall encloses a court 17 by 15.5 meters in dimension. A gate in this wall opens to the southeast.

Kiva: The configuration of the mound and rubble mass in the northeastern corner of the structure suggest a housed surface kiva roughly six meters in diameter.

Masonry: The building is constructed of unshaped slabs of Menefee Sandstone. The structure is reduced to a rubble mound with no wall alignments clearly visible. Wall width could not be measured although the mass of rubble suggests rubble core walls probably 40 to 50 centimeters in thickness.

Middens: A midden 32 by 20 meters is located 16 meters east of the building. The mound is approximately 50 centimeterrs in relief and is composed of sand with dense sherds and spalls. Slabs are present. A ceramic/lithic sample one meter square was recorded on the midden surface.

A surface scatter of ceramic debris was noted downslope to the southwest of the structure. This scatter measures roughly 32 by 20 meters in extent and was not sampled.

Ceramics (sample area equals one meter by two meters):

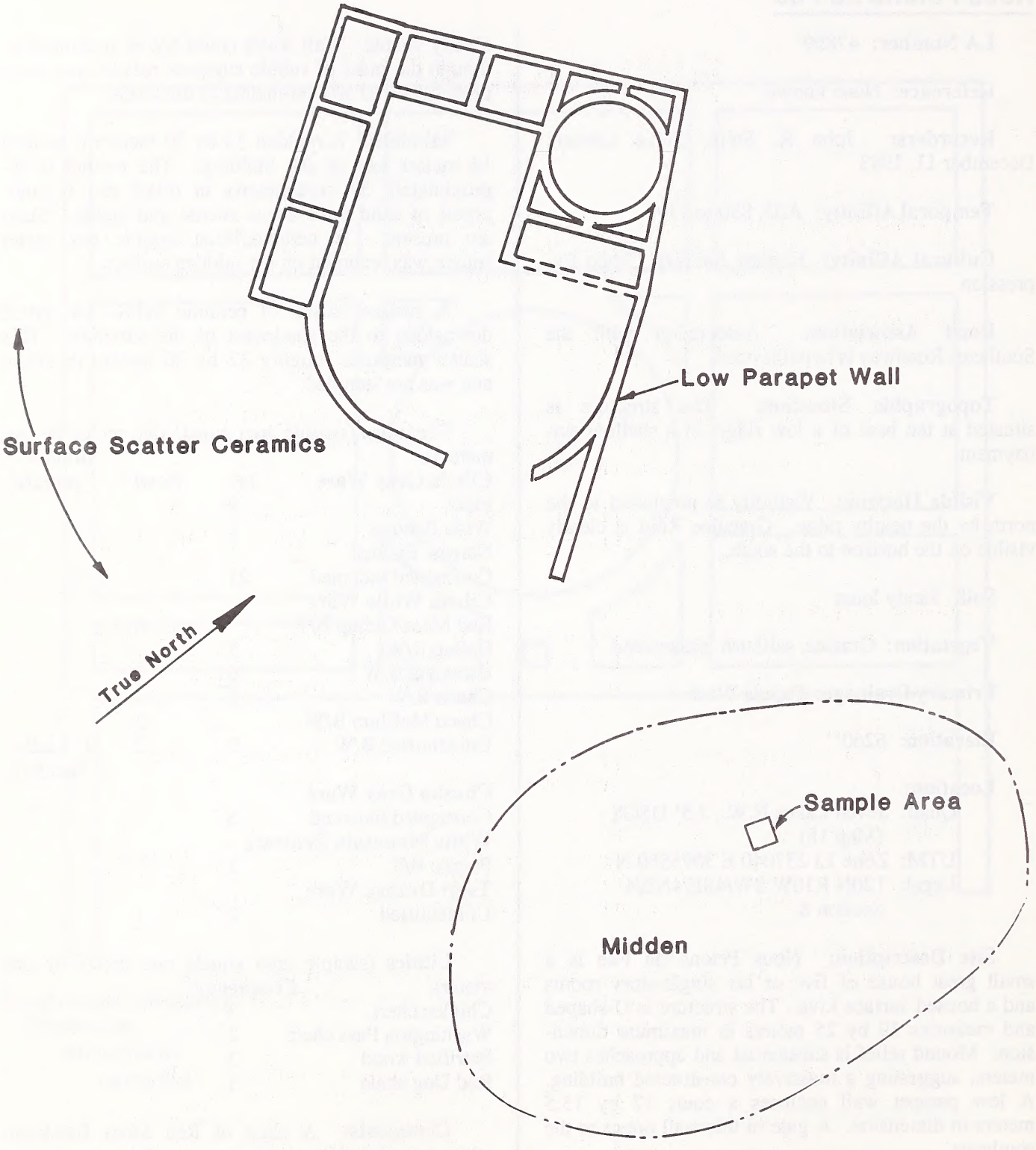
	Jar	Bowl	Indeterminate
Cibola Gray Ware			
Plain	9		
Wide Banded	1		
Narrow Banded	1		
Corrugated Indented	21		
Cibola White Ware			
Red Mesa/Gallup B/W		6	
Gallup B/W	7		
Escavada B/W	6		
Chaco B/W	5		
Chaco McElmo B/W		2	
Unidentified B/W	9	2	(1 Ladle Handle)
Chuska Gray Ware			
Corrugated Indented	6		
White Mountain Redware			
Puerco B/R	2		
Tsegi Orange Ware			
Unidentified	2	1	

Lithics (sample area equals one meter by one meter):

	Frequency
Chinlee chert	3
Washington Pass chert	2
Petrified wood	3
Red Dog shale	1

Comments: A trace of Red Mesa Black-on-white but no polychromes were noted in examination of the midden. There seems to be a high incidence of materials originating on the western margin of the basin, such as Tsegi Orange Ware, trachyte tempered utility ware, and Washington Pass chert.

The site appears to be stable and relatively free from vandalism. What appears to be a narrow trench has been excavated into the rear wall of the structure but is now healed and is not conspicuous.



NOUS PETONS DU FEAU
LA 47859

Mapped By: John R. Stein &
Stephen H. Lekson
December 11, 1983

BIBLIOGRAPHY

Bannister, Bryant, William G. Robinson, and Richard L. Warren
1970 *Tree-ring dates from New Mexico A, G-H: Shiprock–Zuni–Mt. Taylor area.* Laboratory of Tree-ring Research, The University of Arizona, Tuscon.

Beal, John D.
1976 An archeological survey of two sections of land in McKinley County, New Mexico. Ms. on file, School of American Research, Santa Fe.

1980 Archeological survey of 13 square miles adjacent to the Desliz Escarpment, McKinley County, New Mexico, Part I - Survey results. Ms. on file, School of American Research, Santa Fe.

1981 Additional archeological survey adjacent to the Desliz Escarpment: An addendum to the management document. Ms. on file, School of American Research, Santa Fe.

Condie, Carol J., and Richard W. Loose
1982 Investigation of a suspected Anasazi road segment on New Mexico State land near Crownpoint, McKinley County, New Mexico. Quivira Research Center Publications 42. Ms. on file, Quivira Research Center, Albuquerque.

DiPeso, Charles C.
1974 *Casas Grandes: A fallen trading center of the Gran Chichimeca, Vol. 2: The Medio Period.* Amerind Foundation, Dragoon, Arizona.

Dulaney, Alan R., and Steven G. Dosh
1981 *A Class II cultural resources inventory of the southern portion of the Chaco Planning Unit, McKinley and Sandoval Counties, New Mexico.* United States Department of the Interior, Bureau of Land Management, Albuquerque.

Fowler, Andrew and John R. Stein
1983 BLM competitive coal tract cultural resource inventory interim report, Crownpoint Northeast Tract. Ms. on file, Farmington Resource Area, Bureau of Land Management, Farmington.

Gauthier, Rory P., John R. Stein, John B. Broster, David E. Stuart, and Stephen L. Fosberg
1981 The GASCO Survey: A 100 mile pipeline from Star Lake to Gallup. In Working Draft Series 2, edited by David E. Stuart, Mark E. Harlan, and John Broster. Ms. on file, Office of Contract Archeology, University of New Mexico, Albuquerque.

Gossett, William J.
1982 Cultural resource inventory of the Metric Corporation's surface coal mine and access road right-of-way, McKinley County, New Mexico. Ms. on file, School of American Research, Santa Fe.

Haury, Emil W.
1976 *The Hohokam, Desert Farmers and Craftsmen: Excavations at Snaketown, 1964-1965*. University of Arizona Press, Tuscon.

Hayes, Alden C.
1981 A survey of Chaco Canyon archeology. In archeological surveys of Chaco Canyon New Mexico, by Alden C. Hayes, David M. Brugge, and W. James Judge. *National Park Service Publications in Archeology* 18A:1-68.

Judd, Neil M.
1964 The architecture of Pueblo Bonito. *Smithsonian Miscellaneous Collections* 147(1).

Kincaid, Chris, John R. Stein, and Daisy F. Levine
1983 Road verification summary. In *Chaco Roads Project, Phase I: A Reappraisal of Prehistoric Roads in the San Juan Basin*, edited by Chris Kincaid, pp. 9-1 to 9-78. United States Department of the Interior, Bureau of Land Management, Santa Fe and Albuquerque.

Kintigh, Keith W.
1982 *Settlement patterns in late Zuni prehistory*. Unpublished PhD. dissertation, Department of Anthropology, University of Michigan, Ann Arbor.

LeBlanc, Steven A.
1976 Temporal and ceramic relationship between late PIII sites in the Zuni area. *Plateau* 48:75-83.

Lekson, Stephen H.
1981 Chaco Architecture in Continental Context. Paper presented at the Anasazi Symposium, Mesa Verde National Park.

Loose, Richard and Meade Kemrer
1982 Anasazi roads. In *Archeological variability within the Bisti-Star Lake region, northwestern New Mexico*, edited by Meade F. Kemrer, pp. 36-40. United States Dept. of the Interior, Bureau of Land Management, Albuquerque.

Marshall, Michael P., John R. Stein, Richard W. Loose, and Judith E. Novotny
1979 *Anasazi communities of the San Juan Basin*. Public Service Company of New Mexico, Albuquerque, and New Mexico State Historic Preservation Bureau, Santa Fe.

Morrison, Charles Randall
1973 Field report on prehistoric road survey by the Chaco Center Remote Sensing Program, 1973. Ms. on file, Branch of Remote Sensing, Division of Cultural Research, Southwest Cultural Resources Center, National Park Service, Santa Fe.

1979 Notes concerning the 1973 National Park Service Remote Sensing Project survey of Chacoan roads. Ms. on file, New Mexico State Office, Bureau of Land Management, Santa Fe.

Nials, Fred L.
1983a Factors affecting the visibility of roads. In *Chaco Roads Project, Phase I: A Reappraisal of Prehistoric Roads in the San Juan Basin*, edited by Chris Kincaid, pp. 5-1 to 5-27. United States Department of the Interior, Bureau of Land Management, Santa Fe and Albuquerque.

1983b Physical characteristics of Chacoan roads. In *Chaco Roads Project, Phase I: A Reappraisal of Prehistoric Roads in the San Juan Basin*, edited by Chris Kincaid, pp. 6-1 to 6-51. United States Department of the Interior, Bureau of Land Management, Santa Fe and Albuquerque.

Obenauf, Margaret Senter

1980a *The Chacoan roadway system.* Unpublished M.A. thesis, Department of Anthropology, University of New Mexico, Albuquerque.

1983 Evaluation of aerial photography. In *Chaco Roads Project, Phase I: A Reappraisal of Prehistoric Roads in the San Juan Basin,* edited by Chris Kincaid, pp. 4-1 to 4-21. United States Department of the Interior, Bureau of Land Management, Santa Fe and Albuquerque.

Powers, Robert P., William B. Gillespie, and Stephen H. Lekson

1983 The outlier survey: A regional view of settlement in the San Juan Basin. *Reports of the Chaco Center 3.*

Roney, John R. and John R. Stein

1983 BLM competitive coal tract cultural resource inventory interim report, Bisti No. 4 Tract. Ms. on file, Farmington Resource Area, Bureau of Land Management, Farmington.

Stein, John R.

1979 The condition of fifty Anasazi ruins in northwest New Mexico, eastern Arizona, and portions of southern Colorado. Ms. on file, Division of Cultural Research, Southwest Cultural Resources Center, National Park Service, Santa Fe.

1983 Road corridor descriptions. In *Chaco Roads Project, Phase I: A Reappraisal of Prehistoric Roads in the San Juan Baisn*, edited by Chris Kincaid, pp. 8-1 to 8-15. United States Department of the Interior, Bureau of Land Management, Santa Fe and Albuquerque.

Stein, John R. and Chris Kincaid

1983 Archeological inventory methodology. In *Chaco Roads Project, Phase I: A Reappraisal of Prehistoric Roads in the San Juan Basin*, edited by Chris Kincaid, pp. 7-1 to 7-10. United States Department of the Interior, Bureau of Land Management, Santa Fe and Albuquerque.

Stein, John R. and Daisy F. Levine

1983 Documentation of selected sites recorded during the Chaco Roads Project. In *Chaco Roads Project, Phase I: A Reappraisal of Prehistoric Roads in the San Juan Basin*, edited by Chris Kincaid, pp. C-1 to C-63. USDI, Bureau of Land Management, Santa Fe and Albuquerque.

Vivian, R. Gwinn

1983 Identifying and interpreting Chacoan roads: an historical perspective. In *Chaco Roads Project, Phase I: A Reappraisal of Prehistoric Roads in the San Juan Basin*, edited by Chris Kincaid, pp. 3-1 to 3-20. USDI, Bureau of Land Management, Santa Fe and Albuquerque.

Vivian, R. Gwinn and Robert C. Buettner

1971 Field notes and data collected for 1970-1971 NSF grant 3100: Prehistoric water conservation in Chaco Canyon. Ms. on file, Arizona State Museum, Tuscon, and Albuquerque District Office, Bureau of Land Management, Albuquerque.

Windes, Thomas C.
1978 Field notes: shrine/road expedition. Ms. on file, Division of Cultural Research, Southwest Cultural Resources Center, National Park Service, Santa Fe.

1982a The Prehistoric road network at Pueblo Alto, Chaco Canyon, New Mexico. Paper presented at the 81st Annual Meeting of the American Anthropological Association, Washington D.C.

1982b The Pueblo Alto trash mound. In the absolute boar: Tests and excavations at the Pueblo Alto complex 1974-1979. Ms. on file, Division of Cultural Research, Southwest Cultural Resources Center, National Park Service, Santa Fe.

York, Fredrick F.
1982 An ethnographic survey of localities of significance to the Navajo population in the vicinity of the NMGS impact area. In New Mexico Generating Station third-party Environmental Impact Statement: Cultural resources in San Juan, McKinley, and Sandoval Counties, New Mexico, edited by Carol J. Condie. Quivira Research Center Publication 39: pp. IV-133 to IV-186. Ms. on file, Albuquerque District Office, Bureau of Land Management, Albuquerque.

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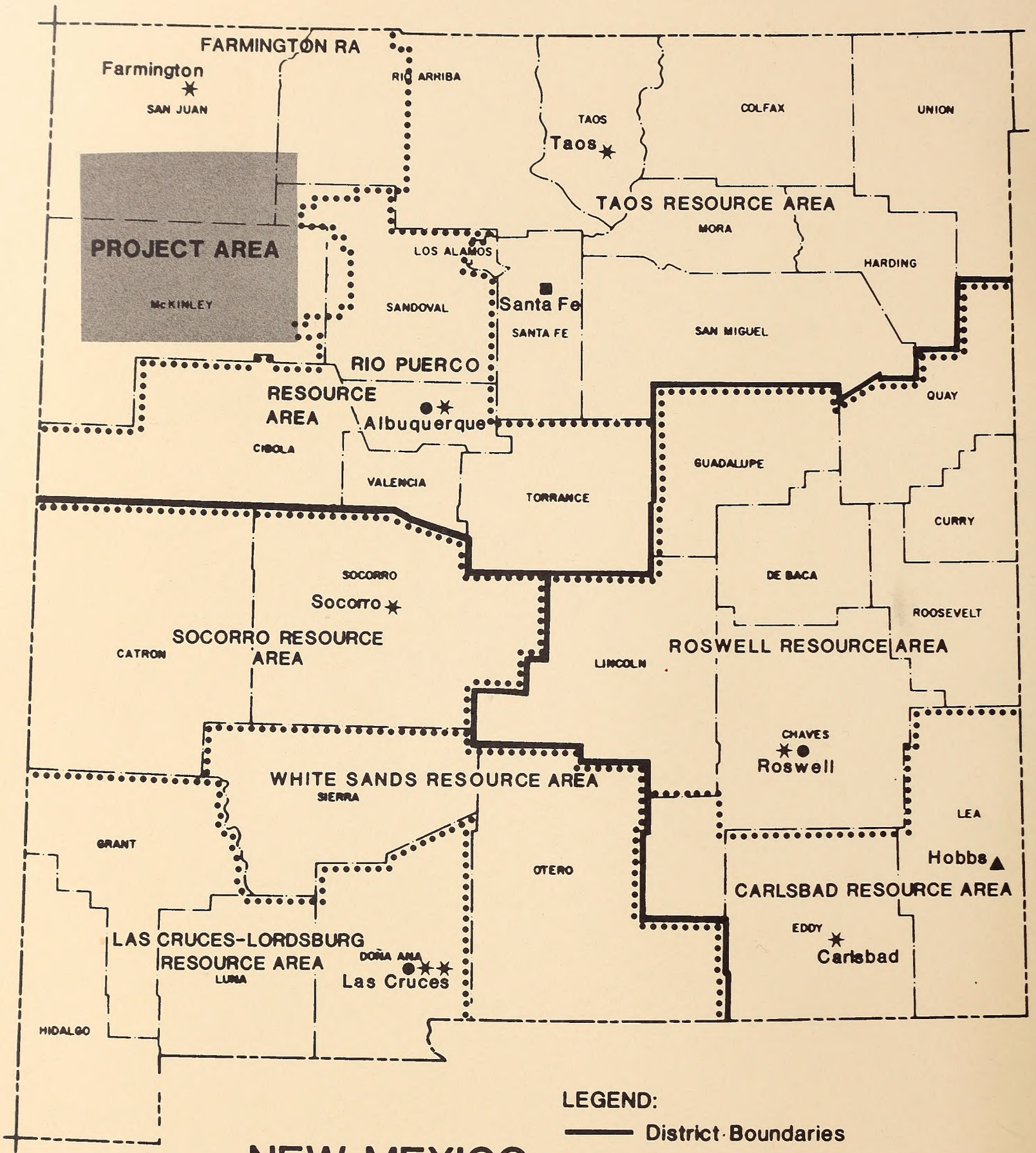

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